TECHNOLOGY DEPARTMENT AUTOMOBILES
First Copy

THE MOTOR AGE

THE AUTOMOBILE AUTHORITY.

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Subscription—Domestic, $2.00; Foreign, $4.00.

Price 5 Cents | CHICAGO SEPT. 26, 1901 | Vol. V. No. 3

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KOKOMO, IND.

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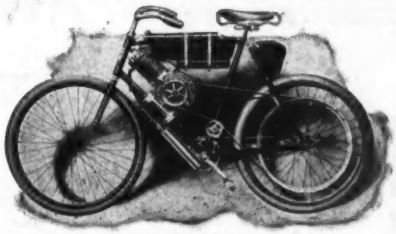

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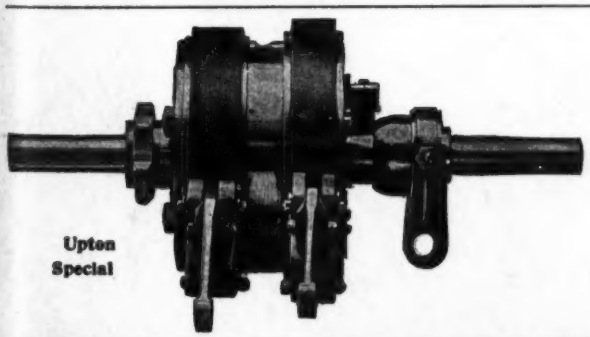

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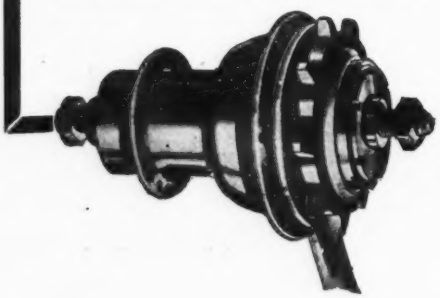

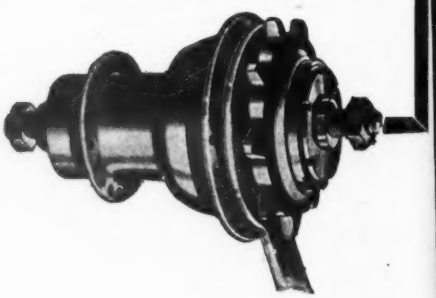

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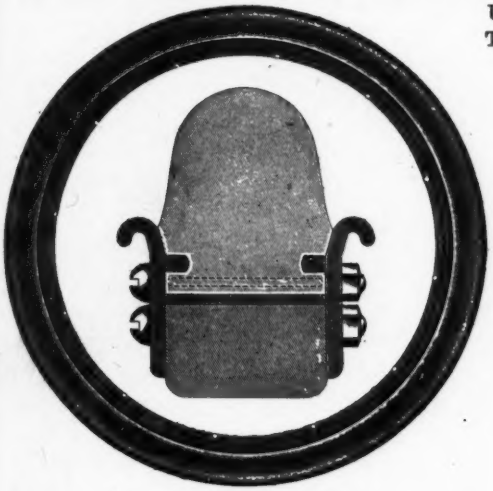

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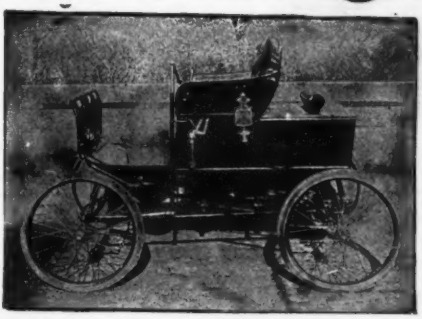

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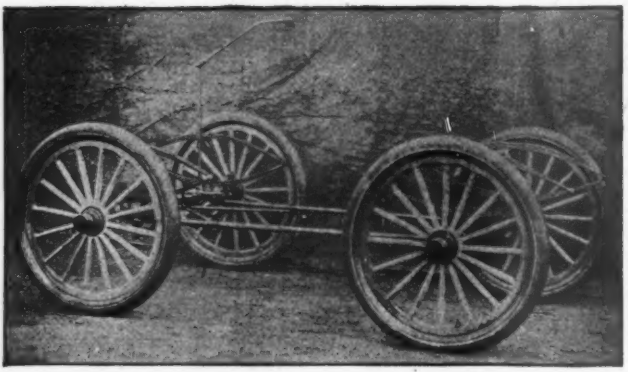

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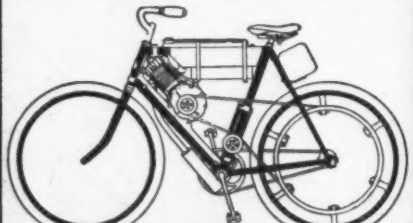

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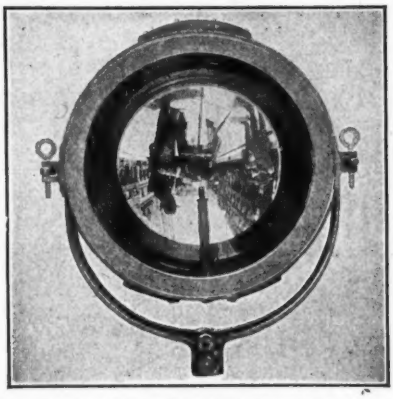

has a lens mirror. You don't have to clean it every time you light up. Turn this up side down and see how perfect it is.

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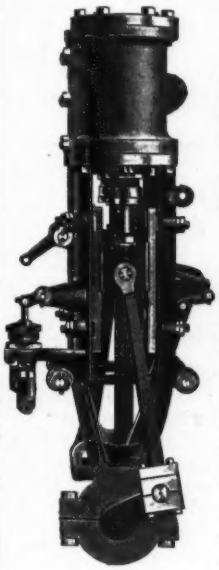

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Engines carried in stock. Can be shipped on receipt of order.

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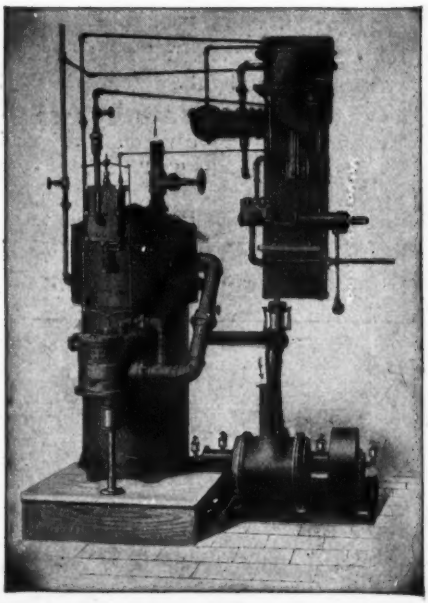

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No condensation.
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We shall be pleased to figure on the requirements of automobile manufacturers.

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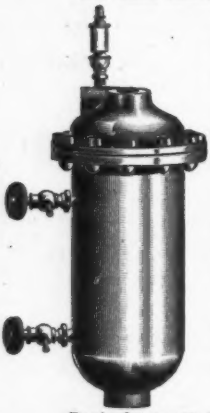
"Low Water Alarm for Steam Carriages"



Low Water in the boiler of a Steam Vehicle is **particularly dangerous** and expensive.

The Reliance alarm is light, strong, and easily attached. It gives the alarm before the water gets too low. Made on the same principle as the celebrated Reliance Safety Water Columns, for stationary boilers, that have been on the market for 14 years, and of which there are over 35,000 in daily use. When you buy a new steam vehicle, insist that the boiler shall be protected by a Reliance Low Water Alarm.

SAFE! SURE! SUCCESSFUL!

Bank of Sumner Sumner, Iowa, Feb. 25. 1901.
THE RELIANCE GAUGE COLUMN CO., Cleveland, O.

GENTLEMEN:—In reply to your favor of the 22d inst, asking how I liked my Low Water Alarm sent me a few days ago, I beg to advise that the same is working entirely satisfactory. I have attached it to my "Locomobile" under the seat and between the engine's muffler and the boiler. I find the space just large enough and the main braces of the carriage are just right to support the Column nicely. I have tested it in various ways and find that it will always give the alarm just as the water leaves the bottom gauge cock in my water column. I consider the alarm very substantially made, and it would seem there is nothing to get out of order or cause trouble. There is no doubt in my mind that it will save my boiler a scorching sometime in the future. Yours very truly,

Signed, J. F. CASS, Vice Pres.

RELIANCE GAUGE COLUMN CO., Sole Mnfrs.
Write for prices. **65 E. Prospect St., Cleveland, Ohio.**
CHICAGO OFFICE, 79 LAKE STREET.

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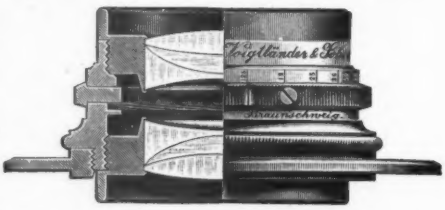

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Have you your camera with you?

Is it modernized and up to date?

If so, it should have a COLLINEAR Lens, the quickest and most perfect anastigmat. Used by the **foremost sportsmen** and the most **experienced travelers.** Can be fitted to any camera. For particulars write for catalogue "T."

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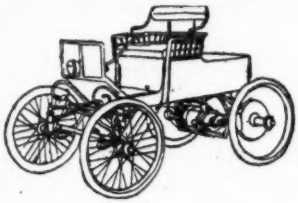
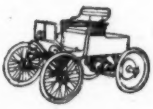
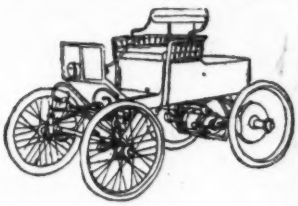
Our No. 5 Lathe is a right and left-hand screw cutting lathe, swings 11 inches on face plate; 34 inches between centers. Is back-geared and has hollow spindle. Has set-over tail-stock and swivel tool carriage for tapering and boring,

SPECIAL OFFER!

The list price of No. 5 lathe is $90. We will furnish the lathe with set of slide rest tools, three lathe dogs, 5-inch chuck with two sets of jaws, lathe arbor and set of Morse twist drills ⅛ inch to ½ inch by 32nds, in all amounting to $110, for $90 cash. Goods carefully boxed and delivered on board cars, Rockford. This gives the best lathe made, with full equipment of tools, for less money than you can buy an inferior machine.

Full Descriptive Catalogue Free on Application.

W. F. & JNO. BARNES CO., 233 RUBY ST. ROCKFORD, ILL.

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Best Gasoline Machine in the world to-day

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Dosadus seat, 4 passenger vehicle, $25.00 extra.

With full leather top, side curtains and storm boot, $60.00.

The new machine weighs 650 lbs. NO NOISE, ODOR OR VIBRATION. "Hundreds of satisfied users."

Ralph Temple

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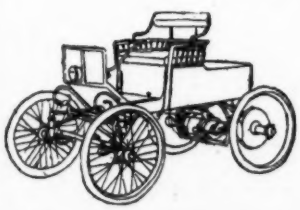
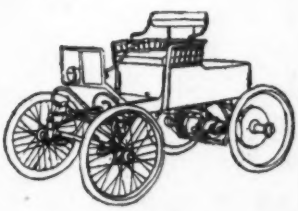




HARLAN W. WHIPPLE.

Member of the Endurance Contest Committee, A. C. A.

ECHOES OF THE ENDURANCE RUN.

New York, Sept. 22.—MOTOR AGE was in the hands to-day of every automobilist interested in any way as contestant, maker or enthusiast and the paper's enterprise in figuring out in advance the substantial records of the test was highly commended. Secretary Butler, of the A. C. A., acknowledged that as far as he could see the figures were substantially correct, though, of course, in the absence of official returns there were some records missing. There are still three books not yet handed in and the committee does not expect to have the official report ready much before the end of the week.

Now that the run is over the committee and members feel that their mouths can be opened a little by way of apology and explanation. They admit the justice of some of the criticisms, especially along the line of the objects of the run having to some extent been defeated by the laxity of restrictions as to repairs and new parts. It must be remembered that the first test run was naturally experimental and that circumstances compelled some laxity of rules, while inexperience was responsible for other errors. Many points were sacrificed to put the run through and to secure a general representation of the leading members and of the American makers. With the great improvement in vehicles sure to result from the experiences of the run next year tests can be put through under stricter regulations that will add greater value to the results.

The Speed Limit Ignored

Had the roads been even reasonably solid, the rules of the run concerning the speed limit, would have been broken beyond repair. Operators soon forgot all about the speed limit, in their anxiety to get there as soon as possible, and nothing but the quagmires through which they passed prevented a higher average than was permitted by the rules. Thanks to the mud one man only exceeded the limit. The official returns will show, no doubt, that he averaged exactly, 15 miles, for no greater speed will be acknowledged. But the fact remains that Mr. Bishop did exceed the limit, and exceeded it very considerably.

An examination of the tables will show that, but for the mud holes between Fonda and Herkimer, and on the greater part of the journey beyond those points, the time limit would have been overthrown by a majority of those vehicles which finally landed at Rochester.

For example, the time limit, figured at 15 miles an hour, for the first stage, should have been 2h., 58m., 24s. No less than twenty-nine vehicles came in in less time, beating it all the way from an hour and fourteen minutes to a few seconds.

At the second stage the time should have been 2h., 27m., 36s. Twenty vehicles finished in faster time.

Time for the third stage, 2h., 45m., 12s., which was beaten by thirty-five vehicles.

The same number beat the time for the fourth stage, which should have been made in 2h., 16m.

At that point the trouble began, and its effect on the progress of the vehicles is eloquent testimony to the difficulties encountered. Mr. Bishop was fortunate in getting into Fonda before the rain commenced, and finished in excellent time, but only fourteen vehicles, in all, managed to get inside the limit. The next stage routed the party completely. The limit should have been 2h., 30m., 48s. Two only managed to get there in that time, the Panhard and one of the Whites. The next nearest was 12 minutes outside and of those who had done so well over the rocky but solid roads of the first two days, a large majority took more than an hour longer than the time limit to reach Herkimer.

To those who care for statistics, the table printed in last week's issue is commended. It contains so much interesting material that it will be months before the full significance of the table will be realized. How many of the vehicles reached the controls in even better time than those recorded above, will never be known. The times given were taken at the time the controls opened, but there was rarely, if ever, a time when one or

more vehicles did not arrive before the time specified.

Comparison of Performances

Since the return of the endurance run participants to the east many and varied assertions have been made concerning the performances in the various classes. No one has figured out the exact returns, for no one, until the arrival of MOTOR AGE, had the figures with which to work. Nevertheless a newspaper article has been sent broadcast, asserting positively that the best performances were accomplished by the heavy carriages, that is, by those weighing over 2,000 pounds, "only five of which that began the run failing to report at Rochester before the closing of the last control there." The following may furnish some idea of the facts:

In proceeding to consider the relative performances of the machines it will be necessary to omit all reference to motorcycles and heavy delivery wagons, neither of which can be considered as playing any part in the contest between the vehicles of classes A, B and C. Nor is it possible to take into consideration any of the vehicles except those which went through the contest without missing a control, for the reason that it is impossible to give them a rating which would enable them to show at all favorably in comparison with the more fortunate class. The figures here given are therefore based on the performances of the twenty-two machines which registered in time at every control:

Class A, for vehicles under 1,000 pounds, had seventeen starters and five finishers; class B, for vehicles between 1,000 and 2,000 pounds, thirty-eight starters and ten finishers; class C, for vehicles over 2,000 pounds, eighteen starters and seven finishers. That disposes of the statement that only five of the heavy class failed to finish before the controls closed. The proportion of finishers shows in favor of the heavy vehicles, the light being second and the middle class third.

That excessive horsepower does not mean corresponding efficiency was demonstrated in this event, as it has been in a number of others. The whys and wherefores are not to be covered by a single article nor by a dozen of them. This one will simply show the results. In the matter of weight per horsepower and average speed per horsepower the little machines made ducks and drakes of their larger competitors. In the accompanying tables the power, weight, time and average distance per hour are shown in table 1. Table 2 shows the weight per horsepower carried by each vehicle and the average distance per hour per horsepower. Table 3 summarizes the work of each class.

The weight per horsepower was approximately the same in classes A and B, but while the latter only averaged 1 mile 1,333 yards per horsepower per hour the smaller class averaged 2 miles 1,156 yards. This figuring, too, is all in favor of the larger vehicles for the reason that their loads, in proportion to their weights, were far lighter than those of the smaller ones. Continu-

Class	Vehicle.	H. P.	Wt.	Time.	Average per hour.
A	Locomobile	3½	900	31:33	12.710
A	White.....	6	995	33:21	11.1285
A	Locomobile	3½	999	37:08	10.950
A	Locomobile	3½	999	38:09	10.455
A	Knox.....	4	700	41:03	9.940
	Total.....	20½	4,593	181:14	54.820
B	White.....	6	1,350	28:03	13.1680
B	White.....	6	1,350	28:29	13.1315
B	Foster.....	6	1,400	29:52	13.185
B	Lane.....	10	1,650	32:28	12.1490
B	Hydrocar...	6	1,800	30:39	12.1330
B	Columbia...	4½	1,700	33:13	11.1378
B	Columbia...	4½	1,640	33:25	11.1254
B	U. S.....	7	1,500	35:23	11.109
B	St. Louis....	7	1,400	37.23	10.820
B	Winton.....	12	1,700	38:56	10.95
	Total.....	69	15,490	327:51	121.856
C	Panhard.....	30	2,500	25:13	15.
C	Packard.....	12	2,100	29:22	13.575
C	Packard.....	12	2,400	30:05	12.755
C	Gasmobile..	9	2,100	30:51	12.1205
C	Packard.....	12	2,100	31:12	12.060
C	Packard.....	14	2,400	31:14	12.935
C	Packard.....	16	2,350	31:49	12.530
	Total.....	105	15,950	209:46	91.680

TABLE NO. 1.

ing the investigation on the same line it will be found that the heavier machines in class C averaged only 1,532 yards per horsepower per hour, though carrying only 152 pounds per horsepower, or 72 pounds less than the class A and B carriages.

Table 2 shows the average weight per horsepower carried by all the vehicles which finished without missing a control, regardless of class. It would be quite possible, of course, to continue the calculations and reduce the table so as to show, as well as figures can show, the position on the scale of excellence to which each vehicle is entitled. In view of the fact that the official returns will probably be issued within a few days and may show some changes in the tables, it will be well to await the final outcome before printing such a list.

After Effect of the Test

Opinions vary among trade men as to the effect of the run on the public mind. Some contend that the public, being unable to appreciate the true condition of the roads, will argue that the average speed made was not creditable and that the comparatively large number of machines which failed to reach Rochester proves that the automobile is not a reliable vehicle. Others, and these are in the majority, regard the event as the finest advertisement automobilism has ever received and possibly that it will receive in this country. It is no exaggeration to state that hundreds of thousands of people saw the machines at some point on the route, but even the importance of this fact is dwarfed by the almost unbounded publicity given the event by the press. The press clipping associations have already sent to the office of this paper so many newspaper articles on the subject that it has been impossible to look at, to say nothing about reading, one-tenth of them.

The cost of the test to the manufacturer was, of course, heavy, but the amount of money expended could not have purchased 5 per cent of the newspaper space freely given. The event will continue to be a subject of comment and debate by the papers for many weeks.

There is another feature which goes to prove the value of the event. It is true that the improvement of roads will be a long-drawn-out operation and that no immediate results will accrue. But this automobile business is developing, not for a year nor a decade, but for all time. By no other means could the need of road improvement have been so thoroughly drilled into the minds of the people. Even some of the contestants, men of wealth and standing, had little conception of the difficulties to be encountered. Fortunately the good roads convention was in session at Buffalo the following week. As a result of these two events the cause of good roads

Class	Vehicle.	Weight per horse-power.	Average distance per hour per h. p.
A	Locomobile	285	3.0020
A	Locomobile	285	2.1638
B	Columbia	378	2.1088
B	Columbia	364	2.1060
A	Knox	175	2.675
B	White	225	2.573
B	White	225	2.512
B	Foster	233	2.324
B	Hydrocar	300	2.221
A	White	166	1.1681
A	Locomobile	257	1.1358
B	United States	214	1.1021
B	St. Louis	200	1.873
C	Gasmobile	233	1.721
B	Lane	165	1.501
C	Packard	175	1.195
C	Packard	200	1.146
C	Packard	175	1.080
C	Packard	171	.1509
B	Winton	142	.1475
C	Packard	147	.1353
C	Panhard	83	.880

TABLE NO. 2.

THE NET RESULT.

Class.	No. started.	No. finished.	Average finished.	Average horsep'r	Wt. per h. p. exclusive of psngr.	Average distance per hour.		Average distance per hour per h. p.
						M.	Yds.	
A	17	5	29.41	4.10	224	10	1572	2.1156
B	38	10	26.31	6.90	224	12	264	1.1331
C	18	7	38.88	15.	152	13	97	.1532

TABLE NO. 3.

will receive attention, in the eastern part of the country at least.

Another Hill Contest Protest

Among the protests in the hill climbing contest is one filed by the Steam Vehicle Co. of America, whose Reading carriage, operated by Mr. Lengle, was detained on the hill over 5 minutes by the stoppage of the wagon in front of it. The company claims its carriage could have negotiated the hill in 3 minutes had the road been clear.

Bishop's Friendly Action

As an indication of the good feeling existing between most of the competitors in the late endurance test the following incident is related: C. A. Benjamin, who ran the winning Locomobile, is a native of Syracuse and known to nearly every man, woman and child in that city. Naturally he desired to take first place at that point and many of the other competitors knew it. Ben made a bold effort for the honor, but toward the end of the journey found himself in difficulties, his gasoline bad and nearly exhausted, his machine plastered with mud and, after a hard tussle with roads and weather, not in the best shape to make speed. Nearing the city he was overtaken by the all-conquering Bishop with his big Packard. Bishop stopped, stated his knowledge of Ben's desire, asked him whether he was in good condition to finish in reasonable time and stated that if it would do any good he would willingly take second place. Unfortunately for his good intentions Ben was unable to answer in the affirmative and five machines finished ahead of him. He took revenge on most of them next day when he ran into Rochester third and in excellent shape.

WINTHROP E. SCARRITT.
Member of the Endurance Contest Committee.

Unusual Equipment Was General

There may have been a vehicle in the run equipped exactly as it would be when delivered to a customer, but if so no one discovered it. The club contemplated that every vehicle should be so equipped. On steam vehicles there were extra gasoline tanks, pumps and all sorts of appliances calculated to take the place of some disabled member. On the gasolines the mufflers were removed, there were extra supplies of gasoline and sundry other items not contemplated by the strict letter of the law. But it was all excusable. The operators realized that they were about to engage in a test whose equal had never been seen, and made preparations accordingly.

Mobile Makes Fast Trip

The explanation given by the Mobile company for its failure to take part in the endurance run, was that the factory was too busy for the management to give any attention to outside matters. After the run had started, however, J. Randolph Walker, the youngest but one of the most active members of the family, became uneasy and decided to make the trip. So he ordered out a wagonette, and with three companions started on the journey. Stopping only when necessary to rest, the party made as good speed as possible to Buffalo, arriving there about the same time the contestants were reaching Rochester. The vehicle, plastered with mud, and with one wheel a little the worse for wear, was on exhibition at the company's Buffalo store for several days. Mr. Walker stated to the writer that they had absolutely no trouble on the journey, except the bending of a spindle, which did not delay them, and with which they finished, making the repair after arrival at their destination.

A Nice Looking Crowd

The estimate of the appearance of the party expressed by the president of the vil-

lage of Herkimer caused a great deal of amusement. The good people of the village had turned out in their might, and crowded around the hotel during the evening. About 8 o'clock, some one brought a biscuit barrel from a neighboring store and there were calls for a speech from President Charles D. Thomas. The worthy gentleman mounted the treacherous platform and commenced a neat little address. Casting his eye over the crowd of mud bespattered automobilists, he said: "Well,—you—are—a—nice—looking—crowd."

Endurance Run Proverbs

If at first you don't succeed, pump, pump, pump again.

The fifteen cent gasoline dealer apparently forgot the commandment: "Thou shalt not commit adultery."

"Three swallows don't make a spring," but judging from the experience of some of the contestants a spring will sometimes cause a fall.

The proverb "look well to thy going," was ignored by some of the chauffeurs to their utter discomfiture.

"Make haste slowly," were the watchwords of some of the chauffeurs, and they ofttimes arrived first.

President Theodore Roosevelt recently wrote to the Waltham Mfg. Co. for a motor bicycle catalogue. A scramble was made in the Orient office for the then vice-president's autograph.

Protected by Tarpaulins

As soon as the condition of the road became such that no ordinary precaution could prevent mud being thrown into all parts of the vehicles, the operators began to look about for some form of shield. The result was that a great majority finished with tarpaulins, canvas or some other protector suspended from the running gear. The trick is an old one, but it will be worth making a note of so that the tourist may be provided with something of the kind in case of storms.

Notes About Buffalo

The Powers House, at Rochester, was voted by far the best hotel on the run. When the contestants reached Buffalo many of them were entertained at the Lenox, which, in addition to providing splendid entertainment, is the headquarters of the automobile club and only two blocks away from the now famous Buffalo storage station. The latter is the most unique affair of its kind in America. Instead of being located in a thickly settled part of the business district it is in the heart of the best residence portion of the town. No paving save asphalt is to be found anywhere near it. It stands back 200 feet, or more, from the road, and has all the facilities the automobilist could wish.

Whether Buffalo was in its normal condition or whether all the automobiles in town turned out last week as a special mark of favor to the visitors is unknown, but we have never seen so many machines on the streets of any other city. The Buffalo branch of the Electric Vehicle Co. is certainly doing a thriving business and the Mobile company's wagonettes were to be seen in all parts of the city. The success of motor vehicles in Buffalo is of course due in large measure to the magnificent streets.

Rooms at a Premium

But for the kindness of Syracuse automobilists some of the contestants would have gone to bed with their boots on in that city, and with nothing softer beneath them than

S. M. BUTLER.
Secretary of the Automobile Club of America.

a board. On account of the state fair, which was in progress at the time, the hotels were crowded. An amusing story is told of one gentleman who took part in the run but who shall be nameless. He had taken "apartments" at the Yates, but found them unsatisfactory and demanded a change in somewhat pompous style. He was told that a change was impossible. "But," he said, "I am Mr. ——," and then he gave his name and his exalted station. The clerk told him, firmly, that he could do nothing for him, that he was lucky to get any room at all, and that if he was dissatisfied the management would be glad to take his room off his hands.

SPIRIT OF THE PRESS

From the New York Sun: Between Port Byron and Savannah the socalled road ran through the Montezuma Swamp for about 7 miles and for long stretches was covered with water from one inch to 2 feet deep with a bottom of sticky mud. The driving wheels of the machines flew around without being able to secure a hold and spurted mud and water over the carriages and their occupants, clogging up the valves and delicate parts of the motors and at times necessitating the operators standing up to their knees in the mire to scrape the mud from the vital points. To add to the difficulty, the chauffeurs could not tell whether they were heading for the middle of the road or the swamp at either side of them having to depend on the telegraph poles to locate their direction.

Hiram F. Maxim, who has ridden over 10,000 miles in his gasoline Columbia runabout, says that in his 5 years' experience as a chauffeur in this country and abroad he never has met with the conditions which faced tourists today.

Millions Wasted Annually

From the Chicago Tribune: The lesson of the great automobile run from Chicago and New York to the Buffalo Exposition is already clear. It is not alone a lesson for the owners of horseless vehicles. It should interest most deeply every farmer who lives along the line of the route between those cities. All along the road between Chicago and Central Ohio are stalled and broken down automobiles, each of which is an additional illustration of the national lack of good roads.

Better roads exist in New York state, as is shown by the fact that the automobiles starting from Manhattan Island were able to make better progress and even attain considerable speed. More than the projectors of the trip imagined may be gained if the people on the route are aroused to a sense of what they are losing by not having good roads, which are passable at least even in rainy weather.

It makes comparatively little difference to the owner of an automobile if he is delayed, however seriously, on a casual pleasure trip. It is the farmers who use such roads daily who suffer the most. The Agricultural Department at Washington has done a good work recently in pointing out the deficiencies of road making in many parts of the country, and illustrating, at the same time, the methods of building roads which will endure.

It has pointed out that the farming population is yearly put to a loss of millions of dollars by the delays and extra work occasioned in moving its produce to market over the present poor roads, and it has urged that purely as a business proposition good roads should be built as rapidly as possible. Possibly the sight of so many expensive road vehicles unable to make any kind of progress through quagmires of clay and sloughs of mud may bring the lesson even nearer home. What the bicycle began in the way of forcing the improvement of country roads the automobile may yet greatly advance.

Shows a Distinct Advance

From the New York Tribune: Although a gasoline machine was the first to arrive at the designated stopping place nearly every day, this record is evidently due to the 30 horsepower motor which drove it, and not to the type of engine employed. Though none of the steam vehicles had more than 10 horsepower at their disposal, they frequently came in second. Still, it was not

speed, but ability to go through the ordeal of a long, hard trip, which was involved in the contest just brought to a close. And neither class of automobile has shown a degree of fitness that was not known months ago. It is worthy of notice, however, that of the seventy-seven vehicles which started forty-two, or more than half, reached Rochester on Friday. When it is remembered that the daily run this year has averaged nearly 80 miles, and that fully 80 per cent of the vehicles engaged in last year's trial were disabled in one way or another on a much shorter course, it will be seen that a highly-gratifying record has just been made. Far greater powers of endurance have been shown now than were exhibited then.

This result is the more significant when the highways traversed and the weather encountered are taken into consideration. Up through a large part of the state the roads are scarcely wide enough for teams to pass each other. And a little swerving from the middle, especially when going at a high rate of speed, is likely to cause an upset. That sort of accident seems to have been common on Wednesday, when the mud, produced by heavy rains, not only clogged the wheels and spattered the exposed parts of the machinery, but rendered the track treacherously slippery. Another kind of mishap, collision, was favored the day before by the dense clouds of dust which enveloped the contestants. The gradual thinning of the ranks during those five days appears to have been due more largely to these causes, combined with careless driving, than to defective construction.

There is room for further improvement in strength and workmanship, no doubt, but it is apparent that a distinct advance has been made in these particulars within the last twelve months. And, after all, when horseless carriages are put to their legitimate and normal use, pleasure driving, they are not likely to be subjected to conditions so exacting as those imposed by this week's test.

Accommodate the Farmers

From the Utica Press: The automobiles which went through this town Thursday morning and which toiled up the Mohawk valley the day before, are out on an endurance test, and if it is endurance they are seeking they have had it with a vengeance. The roads, none too good at best, were made terribly bad by the rains. The strength of the machines and the patience of the riders were, indeed, given a severe test. That is what they wanted, and presumably few of them will be disposed to complain. The automobile which is good only in the sunshine and over asphalt pavement is not a very practical vehicle for use in a climate and a country where there are rainy days and muddy highways. It will be a case of the survival of the fittest and that is what this expedition was inaugurated to determine.

It is generally recognized that the automobile is the coming vehicle. It is growing in popularity and general use. At first the machines were looked upon as an expensive toy, and though they are still expensive, the toy feature is giving way to practical utility. Many people are thinking of making purchases, and next year will see thousands more of them than were in use last summer. One of the results will be a demand for better roads. The automobile owners will be easier organized and in better shape to make their wants felt and wishes recognized than the horseman. Good roads are just as valuable to those who drive horses as to those who ride in carriages propelled by steam, gasoline or electricity. But the latter have larger enthusiasm and are likely to approach the legislature with more unanimity. They are sufficiently numerous to make their influence felt. The good roads that the automobile will secure will prove as great an accommodation to the farmers and others living along their line as to the automobilists.

From the Minneapolis Times: As far as it got, that automobile endurance race in New York state demonstrated that the good roads movement is not throwing as much dirt as it should in the richest and most prosperous commonwealth in the Union.

SOME OF THE VEHICLES ENGAGED

Despite the execrable roads the heavy American gasoline machines managed to get through without great trouble. The run proved conclusively that the one thing which needs most serious attention is the sparking device. The Panhards had no trouble on this account, because of their hot tube ignition and their freedom from delay may be attributed, in no small measure, to this cause.

Four New But Good Machines

Four of the latest developments of the automobile builders started in the run practically unknown to the public. These were the White, the Pierce, the Toledo and the Hydro-car. The performance of the first named was watched with intense interest for two reasons; first because it is manufactured by a concern with a reputation for the production of good goods and second, because of its flash boiler, the first manufactured commercially in this country. The vehicle has been a long time in preparation because the company determined to learn what it was necessary to learn, at its own expense, instead of that of the public. The result, so far as this run could determine, was an unqualified success. The only argument heard concerning it, except such as

The White Steam Carriage.

were complimentary, was that its consumption of gasoline was greater than that of some of the other steam carriages. It is altogether likely that this is true, if for no other reason because of its large boiler, but this will hardly be considered a serious drawback in the case of a vehicle which has demonstrated its ability to go anywhere in any sort of weather. The White finished first and second in class B, for vehicles between 1,000 and 2,000 pounds and second in class A, for vehicles under 1,000 pounds, being beaten an average of about three-quarters of a mile in the latter by one of the Locomobiles. These three White carriages went through the ordeal without missing a control and the fourth missed but one.

The second of the newcomers, the Pierce, proved a phenomenon indeed. It is a little gasoline runabout weighing but 600 pounds, with full equipment, and is driven by a 2¾-horsepower De Dion motor. Each of these little vehicles missed but one control, both passing successfully through the ordeal between Fonda and Herkimer. In this Slough of Despond they out-generaled a majority of their competitors, arriving nearly an hour ahead of some other machines with five or six times as much power and three times as much weight. One of them missed the control at Rochester, but came in shortly after it had closed. The other finished in twenty-fourth position.

The two remaining strangers were the Toledo steam and the Hydro-car, gasoline, both made by the American Bicycle Co. The Hydro-car is little more than an experimental machine. It was made a long time ago at the Gormully & Jeffery factory and no one expected it to take part in the event. Nevertheless it went through without losing a control and its average, so far as can be learned at present, was eighth on the list. The Toledo, one of the largest and roomiest of steam vehicles, was not quite so fortunate. There were two of them on the run, but their time was not taken beyond Syracuse. Details of the delay beyond that point have not yet come to hand, but until then they were well up with the procession.

Construction of the Toledo

The American Bicycle Co., in presenting to the public its Toledo steam carriage, has signified its evident belief that the general run of steam vehicles is too light to stand up under continued use and the evident favor with which the Toledo has been re-

ceived goes to prove the wisdom of that position.

The most casual observer will notice at once the appearance of strength and stability which pervades the whole machine. The running gear, while in no sense appearing cumbersome or unnecessarily heavy, gives the idea of being built to stand rough usage. The tubing used is 1¾ inch seamless, the steering knuckles and frame connections are of substantial proportions and the bearings are large enough to be in keeping with the general effect.

The engine is 6½ horsepower and differs from the type in general use principally in the matter of size. The cylinders are 3x4. The frame is box pattern, giving great rigidity and providing double slides for the cross heads. It is entirely encased and dust proof. The usual cross-head pump for supplying water to the boiler is provided, as well as a pump for keeping up the air pressure. This pump is automatically cut out when the required pressure is exceeded and is entirely automatic in its action, so that the operator is relieved from all care in this respect. The water and gasoline tanks are considerably larger than those in general use, the water tank holding 35 gallons and the gasoline tanks, of which there are two, hold 4½ gallons each. The boiler is tested to 800 pounds cold water pressure and, as the working pressure is 175 pounds, the factor of safety will be found ample to assure the most timid. All boilers are provided with safety valve set to blow off at 220 pounds.

The burner is fitted with a pilot light which is kept burning at all times when the carriage is in operation and may be left lighted when the main burner is extinguished and generates sufficient heat to hold the water at high temperature, greatly expediting restarting the carriage. A novel feature is the auxiliary pump, for supplying the boiler. It is operated by an up and down movement of the steering lever, thereby allowing it to be used at any time without dismounting from or stopping the vehicle. The line at present consists of three models, an open stanhope, the same with closed seat and top, and a surrey. All are handsomely finished

THE PHENOMENAL PIERCE RUNABOUT.

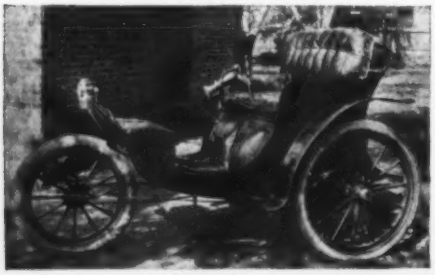
and the close attention to the smaller details, which are sometimes slighted, is readily noticeable.

The Three-Wheelers

Even those who disbelieve in three-wheelers were forced to admire the performance of the little Knox and Duryea machines. Few would have believed it possible for the former to get through without missing a control, yet it managed to do so. The Duryea was less fortunate, having been thrown into a ditch by a vile spot in the road between Fonda and Herkimer, but it landed in Rochester in as good time as the average, apparently none the worse for the journey. It got away from Hudson somewhere among the thirties and landed sixth at Albany. The Duryea company had a four wheeler out, but it was not entered in the contest. Although just out of the shop it finished the trip to Buffalo.

The excellent performance of the little Duryea three-wheeler, operated by Mr. Burhan, in the Endurance test, has done more to dispel the objections to this class of vehicles than pages of argument could have accomplished.

This machine, which is in every particular the regular product of the Duryea Power Company, was rushed through the factory in order to be ready for the start, and was given no preliminary tuning up whatever, yet it negotiated roads that ap-



The Duryea Three-Wheeler.

palled the drivers of heavier and much more powerful vehicles, and at Nelson Hill was close to the winners.

The proof of the pudding has long been claimed to be in the eating, and as the only particular objection recorded against the three-wheeler has been its supposed inability to travel over rough country roads and the showing made by this machine under the particularly trying condition of the Endurance test will go far toward disproving that theory. Leaving out this objection, there are many good features to the three-wheeler. By virtue of its three-point support, the frame is greatly simplified and lightened, and, with the single steering wheel, the vehicle may be turned around in but a very small portion of the space required by a four-wheeler of equal wheel base.

The Pierce Phenomenon

The wonder of the trip was the Pierce machine. This little affair is shown in the accompanying illustration and simply did wonders. It is a well-recognized fact that what the Pierce company does it does well, but no one expected it to take a motor of 2¾ horsepower and build around it a vehicle which could accomplish a feat which overcame vehicles of five times the power and three times the weight. The motor is a De Dion. The weight of the machine is 500 pounds, or, loaded for such a journey as it has just successfully completed, 600 pounds. It has two speeds, 4 miles for the low and 22 for the high. It carries gasoline enough for 100 miles, and water for 45 miles. The head of the motor, by the way, is water cooled. The wheels are 26 inches, and the width of the tread, to the outside of the tires, is only 44 inches. Two of these remarkable machines took part in the run, and both reached Buffalo on Saturday. Each carried two passengers and missed but one control, both going successfully through the heart-rending trip from Fonda to Herkimer, and registering long before the control closed.

The Haynes-Apperson Vehicles

The Haynes-Apperson Company, of Kokomo, Ind., have recently made some marked improvements in their carriages.

The connection between the driving gear and rear axle is now direct, and much more simple and effective than heretofore.

The clutches are supplied with bronze centers, which effectively prevent cutting between the center and band.

The carriages are now all supplied with radiating coils, which have proved very effective in conserving the water supply.

The circulation of the water is accelerated by means of a rotary pump, thus enabling

the motor to perform heavy duty without becoming unduly heated.

The general excellence of their carriages was recently demonstrated by some remarkable road records.

The first was a run from Kokomo, Ind., to Chicago in a single day, covering a distance by the route taken of a little more than 200 miles. The second was a journey from Kokomo, Ind., to New York City in 73 hours.

On the first day of the latter journey the carriage ran from Kokomo to Gallion, Ohio, a distance of 228 miles.

These records were made by the ordinary road machines, such as are sold right along to their patrons. The company does not build any special carriages for racing or other purposes. Their product is rather noted for elegance and smoothness of operation than for phenomenal speeds.

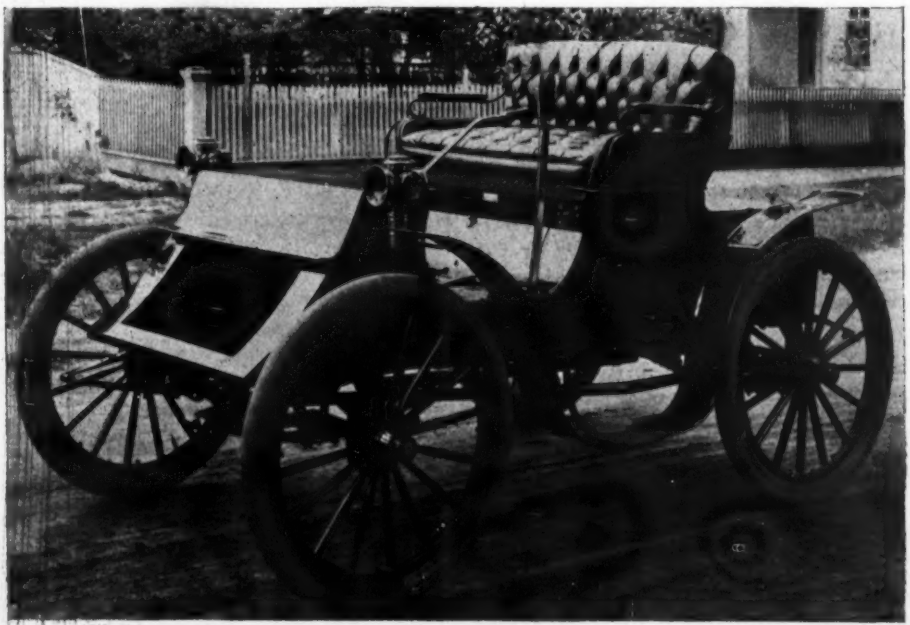
Tires Stood the Test

All things considered the tires used in the endurance run stood the work splendidly. It is one thing to run over the European roads and tell of the small percentage of tire failures and quite another to bump over the rocks, plank roads and disgraceful condition of affairs generally through which the machines were forced in the late test. In no other country in the world have tires ever been so severely handled. It was impossible to get a report of the troubles of all the machines, but of those which arrived at Rochester note was made of the following:

No. 13, a White stanhope, weighing 1,350 pounds, came in with one Goodrich detachable punctured. Its two companion vehicles, of the same weight, came in unscathed, and the same is true of the lighter White, weighing 995 pounds. Tires of the same make, used on Mr. Seligman's Columbia, were good at the finish and on the heavy Holyoke phaeton, weighing 3,000 pounds, and the St. Louis carriage, were in fair order in each case.

The Dunlop detachables on Duryea's three-wheeler and C. J. Fields' motorette, were in good condition and in other cases the report was as follows: Autocar, No. 27, fair; Knox three wheeler, one punctured and two replaced: De Dion, No. 72, replaced.

There were more Diamond tires than any other one make, and the results were as follows: McMurtry's Packard, 2,400 pounds, good; McGregor's Winton, 1,600 pounds, No. 37 Locomobile, No. 23 Packard, all



THE ST. LOUIS GASOLINE CARRIAGE.

good. The Reading, one nail in a tire; Mr. Satterfield's Packard, one tire cut; Mr. Ripley's Gasmobile, good.

No. 23 Packard came in with its Hartford tires in good shape. The Robinson vehicle, weighing 2,425 pounds, beside four passengers, replaced one Hartford on the way. No. 38 Locomobile was in fair shape and all other Hartfords seen were in good condition. Two vehicles used foreign tires. One replaced all four on the way and the other set came through without replacement in fair shape. Two sets of Mungers were seen at the storage station, one in excellent shape and one of the tires of the other cut by a sharp stone. The latter was on an extremely heavy vehicle. The Toledo steam wagon wore a set of G & J tires to the bone, as it were, but, worn as they were, they were still doing business at the finish and holding air as well as any.

Practically every vehicle carried one or more extra tires and there were occasional replacements, but most of the damage was caused by punctures. There was far less talk of tire trouble than one would expect, the net conclusion being that if all parts of the machines might be depended on as thoroughly as the tires, there would be little to complain about.

A Clever Expedient

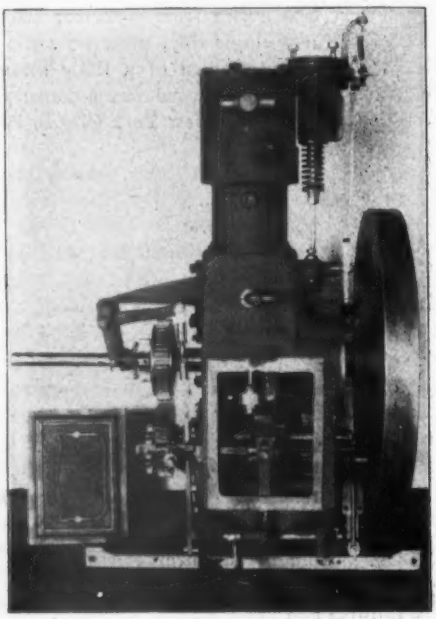
Charles H. Metz made an ingenious change in the driving mechanism of his motor bicycle. The machine is driven by a leather belt, but this stretched so badly in the rain that it was useless. Metz attached a sprocket wheel to the driving shaft, cemented the belt to the bed of the rim of the large pulley and applied a chain. The latter was kept on the driven pulley by the rim and stuck to the belt so well that the operator had no further difficulty.

Work of the Motor Cycles

Next week's issue will contain an illustrated account of the work of the motor bycycles on the endurance run, written by the men who took part.

The St. Louis Engine

In the design of its standard runabout the St. Louis Motor Carriage Co. has introduced many strictly original features, its object being to design a new machine rather than copy an old one. One of the readily noticeable features of the carriage, which gave such a satisfactory account of itself in the endurance test, is the engine. This is of 7 horsepower, and is entirely self con-



tained, all gears, including the chain speeds, being contained in one casting. This gear case is oil tight and the entire gearing runs in an oil bath. There are no gears running idle. The speeds are two forward and a reverse. The carriage is equipped with two brakes, both working either forward or backward. The vehicle weighs about 1,450 pounds.

Contestants told, with many a smile, of the attitude of Superintendent Fisher, of the Automobile Co. of America. He was in one of the company's Gasmobiles, operated by Wally Owen, a dare-devil chauffeur who hesitated at nothing. Mr. Fisher, during the first day, cautioned him repeatedly. The object of the run, he said, was to demonstrate the endurance of the machines, not to race, and he was determined that the Gasmobiles should go through in good shape and in accordance with the rules. Next day, he was less severe, and by the time the third came, was as eager as anyone in the run to "get there" and to beat the fellow ahead. Such is the influence of a contest of this kind, and such the cause which will lead to many a scare at the arrival of a

policeman just at the wrong time, so long as the wheels of automobiles go round.

Joseph J. Mandery, though no longer president of the Rochester Automobile Club, was the really busy man in that town. His arrangements had been well made, and as a result, there was none of that confusion which might have resulted from the arrival of so large a party in a crowded town. The last hill of the journey was at the city limits, and to this point a number of western men, who had gone on to see the last day's run, repaired to see the machines come into Rochester. It was the only chance they had to see the machines at all, but they were well repaid for their trouble. Truly, the automobilist is an enthusiast.

One of the "gentlemen of quality," having been given the word to start at Poughkeepsie, deliberately stood in the middle of the road leisurely arraying himself in his riding clothes, to the great amusement of bystanders, but also to the great annoyance of other competitors who were delayed in consequence. One of the officials, possibly with more pluck than discretion, remarked that, with all due respect to the gentleman's exalted station, he must ask him to get out of the way and complete his toilet elsewhere. Fortunately the gentleman had the good sense to obey the command.

The Foster steam vehicles, of which there were two, gave a good account of themselves, one averaging third in its class, the other missing three controls, but reaching Rochester in better than the average time. The Foster is a 1,400 pound machine, with 6-horsepower, whose makers have recognized the demand for tubes and fitting of ample size. The only criticism to which it was subjected was that it is built too high for such a trip as that undertaken.

Only two machines carrying four passengers completed the trip without missing a control. One of these was a Panhard, with 12 and the other a St. Louis carriage, with only 7-horsepower. The latter was operated by Mr. French and its performance was consistent throughout except between Fonda and Oneida, where the quagmire upset the calculations of every one and rendered slow traveling imperative.

John Jacob Astor showed himself possessed of true democratic spirit. At Hudson he sat down, with the remainder of the grimy chauffeurs, at a 50 cent meal and seemed to enjoy himself as well as any one. Mr. Astor remarked that he has ordered a 40-horsepower American machine and that he will discard his present 20-horsepower vehicle as soon as it is ready.

One precaution, so far overlooked, should be taken in connection with future events. On more than one occasion competitors came down hills at high speed and around a curve at the bottom came upon disabled machines. So far as is known, no serious accidents were caused, but there were a number of narrow escapes.

One of the little Pierce machines ran into a bad spot in the road at Utica and took off a wheel and upset the vehicle. The front axle was broken. Repairs were quickly made with material obtained at the Weston-Mott factory, and the machine went on its way rejoicing.

About three miles east of Utica one of the Panhards lost a tire, and went into the city on the rim. The Weston-Mott factory furnished all the repairing material necessary, and the vehicle was not seriously delayed.

One of the Haynes-Apperson carriages broke an axle at Palmyra, but repairs were quickly made, thanks to the attention of A. J. Garlock, an automobilist of that city.

NOTES AND COMMENTS

New York, Sept. 22.—Secretary Butler, of the A. C. A., has returned from Buffalo and is now engaged in compiling the results of the endurance run to determine the official awards. He says there are but seven or eight books missing. He has telegraphed for them and expects to complete the compilation early in the week. He says that the reports already show that from fifteen to twenty vehicles will be found to have qualified in the first class.

The board of governors met on Wednesday and confirmed the ending of the run at Rochester and the calling off of the Buffalo-Erie race and the week of sports. The big road race and the mile record contest will be run off in October on some course to be secured near New York. No action whatever was taken toward withdrawing the sanction for the Fort Erie races or interfering in any way with their success. In addition to the $1,000 offered by the club as added money to the big sweepstakes, the private subscription list on the bulletin board shows $625 in contributions already.

To Make Panhards Here

New York, Sept. 22.—Messrs. Charron and Girardot will sail for home on the Kaiser Wilhelm der Grosse on Tuesday. They came to this country to study automobilism and trade conditions, with a view to establishing a branch in this country. The object of their mission was speedily accomplished and M. Charron is responsible for the following statement as to their American plans in this country, made to a gentleman who vouches for the statement:

Charron, Girardot & Voigt will begin the manufacture of motor vehicles of the Panhard type in this country. Charron and Girardot have appointed A. Proctor Smith and C. R. Mabley their American representatives. A factory in or near New York, whose identity and location M. Charron refuses to disclose at present, has been engaged and will be at once fitted up for manufacturing purposes with the expectation of being able to fully supply the demand by the opening of next spring. These vehicles will be manufactured on lines similar to the Panhard, of heavy build, and adapted especially to American roads. They will be American machines, built by American workmen from American material. Charron says no workmen will be imported, and that every part of the vehicle, including tires, will be made in the factory. No distinctive name has yet been chosen.

The Parisian firm has been selling agent of the Panhard for five years, and in four years its trade has increased from 1,250,000 francs to 6,000,000 francs annually.

M. Charron has a racing stable and takes back with him a large supply of American harness and saddles. He also takes with him three American built horse vehicles—a runabout, a basket phaeton and a hunting trap.

Coming Races at Detroit

The committee in charge of the race meet of the Detroit club, whose chairman is W. E. Metzger, 254 Jefferson avenue, has issued an invitation to all the noted racing men to take part in the events. The programme will be announced in a few days and will be forwarded to all who apply for it. The meeting takes place on Thursday, Oct. 10, at the Detroit Driving Club's track, one mile in circumference, thoroughly banked and declared by the committee to be good enough for a mile a minute. One thousand dollars' worth of cups and other prizes will be given. The committee invites suggestion as to interesting events and the arrangement of the programme generally.

Referring to the races, Mr. Metzger writes as follows: "The races which we intend holding on Oct. 10, and which are now an assured fact, ought to be the largest affair of its kind held, so far, in this country. We now have three positive entries of mile-a-minute machines. The program will probably be a 25-mile event for the heavy machines, 5 miles for gasoline machines under 2,000 pounds, 3-miles for steam machines, 5 miles for electrics and an obstacle race. We will also give the contestants an opportunity to go for records, if they so desire. The track is the finest

in the country, and the ends will be properly banked for mile-a-minute work. When you consider the fact that the narrowest part of this track is 75 feet, with 150 feet at the home stretch and 125 feet on the turns, one can realize that the records ought to go."

Chicago Club's Tour

While the devotees of the endurance run were wending their way westward an equally grimy but very much smaller band of pioneers was traveling eastward. The members of the party were the survivors of the Chicago Automobile Club's run to Buffalo. Twenty vehicles started from the Auditorium, but of these only six were intended to go the whole journey and three did so. Five reached La Porte and started for South Bend the next day. Four went as far as Toledo and then one turned back. Two Wintons and one Locomobile were the survivors. The first mentioned were operated by E. F. Brown and J. B. Burdett, the latter being accompanied by Mrs. Burdett, who went through the trip like a veteran and seemed to enjoy every foot of the journey. The steam carriage was operated by C. H. Tucker, the company's Chicago manager.

After the stop at Toledo the party was joined by George F. Palmer, operating a Toledo wagon. All went well until a tire on the new vehicle punctured. The occupant requested Mr. Tucker to wait for him and he did so. Later on a slight accident happened to the Chicago man. Instead of returning the compliment the Toledoan went ahead and that was the last seen of him. Now he is busying himself telling the people of Toledo, through the newspapers how easily he did up the Chicago men and glad he is that a Toledo vehicle "did up those costly machines from Chicago." The gentleman is a sportsman, indeed. Unfortunately Mr. Hubbell, who had kindly undertaken to take care of the party in Toledo was called away from the city and did not return until after their departure. They were looked after by Charles Hall, of the Toledo Automobile Co., and Frank E. Southard, of the Toledo Wheel Co. Hall, by the way, took train and went to Rochester to see the finish of the endurance test, accompanied by Mr. Morrison, an enthusiast from Bryan, Ohiio.

The roads were bad and at times almost impassable. At one stage of the journey Mr. Tucker and his mechanic pushed and a team of horses pulled to get the machine over a stretch of alleged road. Like the New Yorkers, the survivors deserve great commendation for their perseverance. After passing Cleveland the party became separated and did not meet again until they reached Buffalo. Mr. Tucker arrived Saturday night and the others, so far as could be ascertained from comparing notes, about the same time. In the matter of numbers the tour was not an overwhelming success, but taking into consideration that it was the first event of its kind the participants are well satisfied. As to experience, they got as much as they are ever likely to get in a week. The club will no doubt make a long tour one of the annual fixtures.

Electric Vehicle Co.'s Meeting

A meeting of the Electric Vehicle Co. is to be held on the first day of October, at which time a statement of the condition of the company will be made to the stockholders. This action is the result of the suit commenced by Richard Seligman. A lot of nonsensical statements and surmises have appeared in the press concerning the future of the company. The enormous amount of business it is transacting and the arrangements it is making to take care of its constantly extending business should be sufficient answer.

Manufacturers' Association Notes

The new secretary of the National Association of Automobile Manufacturers, E. D. Knappen, is entitled to a word of praise for the good work he is carrying on. Since he became secretary the trade has heard more of the association and its work that it had done in the entire time the association had been in existence. Mr. Knappen is using every endeavor to induce the members of the association to interest themselves in increasing the membership and to make the institution useful to those who are already members. His latest suggestion is that members forward to the headquarters of the association framed pictures of their product, the frame bearing a suitably inscribed plate with the name of the member.

Formal notice has been given that the

annual meeting of the association will be held in New York during the week of the automobile show at Madison Square Garden. The exact date has not yet been fixed.

Heretofore associate members have had no voice in the selection of directors or the management of the association. This condition, if continued, may deter many makers of parts and sundries from becoming members and giving to the association that whole-hearted support which it needs and deserves. There is reason to believe that a change is contemplated. We are informed by one of the officials of the association, though quite unofficially, that some step will be taken to give the associate members representation at the next meeting. Attention is called to the fact, however, that formal notice of intention to propose an amendment to the by-laws must be given in connection with the call for the regular meeting, so that if such a change is contemplated notice should be given the secretary at once.

The Ostend Automobile Races

At a few days' interval two important automobile race meetings were held, one in France and the other in Belgium. Results of the first have already been published, and a short account of the Belgium meeting, which took place on Sept. 2 on the race track, is here given. Fully 10,000 people, most of whom were from the most fashionable of Belgium's aristocracy, as well as many distinguished Frenchmen, witnessed the events. The first was a 10-mile motorcycle race. Gaste, on an 8-horsepower Soncin, won in 16 min., 3 4-5 sec., while Deemster, on an Aster-Gladiator, was second, by less than 100 yards. The Werner motor bicycle was third in 22 min., 23 3-5 sec., quite good time for the muddy track. The second event was for vehicles weighing up to 1,430 pounds and was run in two heats and a final. The heats were run over five laps, and the final over ten, or 16 miles. Gabriel, on a 12-horsepower Darracq, won in 26 min., 27 1-5 sec.; Deschamps, on a Deschamps, was second in 27 min., 24 1-5 sec. The last event for vehicles weighing more than 1,430 pounds, was over 15 laps, and was won by Baron de Caters, on a 24-horsepower Mors, covering the 40 kilometers and 500 meters in 45 min., 1 3-5 sec. Count E. T. Serclaes, no a Bolide, was second, and Baron E. J. de Crawhez, on a Panhard, third. The other starters were Serpolet, on a steam carriage; Brule, on a Daimler, and Zabrillowisky, on a Panhard-Levessor. The meeting was so successful that Aug. 15 has been selected for next year's meeting.

Novel Advertising Idea

The Rochester Automobile Company, of Rochester, N. Y., has recently sent to various automobile agencies in the adjoining states a number of placards with the request to place them in their show rooms and repair shops, and has offered as a return compliment to place theirs in their own establishment. This is to notify automobilists en tour where they may obtain needed supplies. The cards sent out are 14x28 inches, with the following reading matter: "Automobilists en tour passing through Rochester are invited to make their headquarters with the Rochester Automobile Company, Jos. J. Mandery, Proprietor. Expert repairs, gasoline, tires, etc. A full line of sundries."

The company has received many complimentary letters from others in the line, many of whom state that they are going to get out cards of a similar nature. Many have already sent in their cards, which are already displayed in the Rochester company's establishment. The company states that they will be pleased to send placards to any dealer who has not received them, and would be pleased to display his in return.

This is a novel method of advertising and is agreeably different from the cut-throat methods existing in many other lines of business, and it is certainly hoped that the Rochester company and all taking up the idea with them will be amply repaid.

Will Race at Joliet

The Joliet (Ill.) Driving Club has lately been incorporated and has taken possession of the driving park in that city. The club intends to hold a race meet in the near future, having already gone so far as to make arrangements for its prizes. The date has not yet been fixed and is dependent on eastern fixtures. The racing men will be in Detroit on Oct. 10 and an endeavor will be

made to have them continue west and take part in the Joliet events some time during the following week. W. C. Crolius is the chairman of the committee in charge of the arrangements.

Power of the Toledo

While returning to Chicago from South Bend, Ind., recently, Dr. Pine ran out of gasoline at Hobart and was unable to get a drop. He ran through two or three small places without finding any and had made up his mind that he would have to abandon his vehicle to the care of some wayside farmer, when along came a Toledo steam vehicle, in charge of two gentlemen bound for some point in Wisconsin. The doctor's account of what followed is one of the finest possible testimonials to the excellence of the Toledo. "They kindly volunteered to tow me," he says, "and the way they did it was a caution. They pulled me into Chicago, a distance of about 30 miles at top speed and very nearly, if not quite, as fast as I should have come had I been able to run under my own steam. And all this in spite of the fact that one of their rear tires was flat at the start and the other very nearly so when we arrived in Chicago. I never saw a machine make steam like that one or continue so long a journey with so little water. It was the most remarkable performance for a steam vehicle I ever heard of and I have had about as much experience as most people with vehicles of that class."

Bostwick's Bad Spill

Prominent automobilists can rarely complain of too little publicity, yet the fact that Mr. Bostwick received a painful injury last week, seems to have been almost entirely overlooked. He arrived in Buffalo expecting to take part in the Erie-Buffalo race, and determined to take a run over the course. The road was in such vile condition, however, that his machine slipped and ran him into an orchard, upsetting him and causing a painful injury to his leg. No serious results are anticipated, and he was able to be out before the bulk of the party left Buffalo.

The Next Chicago Show

The Chicago Automobile Club will shortly give notice to the trade of its intention to hold a show in Chicago next March, in conjunction with the National Association of Automobile Manufacturers. President Davis, of the association, came to Chicago a few days ago and held a conference with President Donald, of the club. The result was an arrangement under which the support of both organizations was pledged to the event. The manufacturers expect to have all their new models for 1902 ready by that time so that the show will undoubtedly be the most interesting yet held in America.

Another Hill-Climbing Contest

The unsatisfactory outcome of the hill climbing contest on Nelson Hill, in which there have been quite a number of protests filed, seems to be very generally acknowledged, and the board of governors already talk of another contest, conducted on scientific principles and under fairer conditions before the season closes. In the new contest the hill climbers will be confined to actual entrants and each vehicle will make the ascent on the hill alone, so as to avoid stoppages by other vehicles. The Eagle Rock, South Orange avenue, Hilton and Summit hills in the Orange district, all fine macadams and long and sufficiently steep rises for a fair test, have been suggested.

New Enterprises

The St. Louis Automobile Mfg., Storage and Repair Co., capitalized at $2,000, has filed articles of incorporation. The stock consists of twenty shares, valued at $100 each. John J. Mielke holds six shares, Edward M. Doyle six, George W. Bonney six and W. J. H. Perkins two.

The Taunton Automobile Co., has been organized at Portland, Me., for the purpose of carrying on business, and licensing others to carry on business of manufacturing, buying, selling, using and dealing in automobiles, motor carriages, motor wagons, bicycles, etc., with $200,000 capital stock, of which $50 is paid in. The officers are: President, Everett S. Cameron of Taunton, Mass.; treasurer, Edward L. Sargent, of Taunton, Mass.

Once more there is talk of the establishment of a factory at Peoria, and, as usual, the Seiberling plant, which formerly made bicycles and tires, is coupled with the report. No reliable details are available.

Jacob Baldner, who has made half-a-

dozen vehicles at Xenia, Ohio, is about to lease a factory there, extend his plant and go into manufacturing on a larger scale.

The incorporation of the Wood Vehicle Co. under the laws of New Jersey is recorded, the principal office being at 224 Market street, Newark. The stated objects of the company are to acquire land, buildings and water power in New Jersey and elsewhere for the manufacture of automobiles. The company's capital is stated to be $300,000, divided into 3,000 shares of $100 each. Joseph C. Wood, of Cohoes, N. Y., D. H. Rittenhouse and I. P. Judd, of Newark, are the names used in connection with the incorporation.

It is reported from Horicon, Wis., that Chicago and Faribault (Minn.) people contemplate the operation of an automobile factory there. There is a company at Faribault known as the Chicago Automobile Co.

Bowman Printing Press Co., Chigo; name changed to Flash-Boiler, Automobile and Specialty Co.; capital decreased from $1,000,000 to $500,000.

The Washington Auto-Vehicle Co. was recently incorporated in Delaware. Its officers are J. Sprigg Poole, president; J. B. Chamberlain, vice president; T. Janney Brown, secretary and treasurer, and these gentlemen and O. T. Crosby, Thos. C. Noyes, Wm. H. Ronsaville and James Virdin constitute the board of directors. The company has acquired the Chamberlain patent on variable speed gearing, under which it will build gasoline vehicles. The company has a temporary shop at 511 Ninth street, where work has begun on certain automobile parts.

Consumers' New York Rubber Tire Co., of New York. To make rubber tires for vehicle wheels and channels and inner fastenings for said tires. Capital $60,000, and directors: William H. Seaich, John W. Horner, Alfred D. Moulton, Hooper C. Barrett and Andrew C. Farnsworth.

The Lansing Auto-Body Co., capital $12,000, has filed articles of incorporation at Lansing, and will make automobile bodies for the Olds concern.

Colonel Pope's Opinion

Gen. Nelson A. Miles and Col. A. A. Pope were on a western hunting tour when the news of the death of President McKinley reached them and started at once for Canton, arriving in Chicago on the 17th. While holding over in this city awaiting train connections they were the guests of Mr. G. H. Atkin, the general western agent of the Electric Vehicle Company. Mr. Atkin took the two distinguished gentlemen on an extended trip through the city in a Columbia automobile showing them the general points of interest.

Col. Pope in speaking of the business situation stated that he considered the prospects very bright indeed and that within the next two years all of the factories in the country would be unable to supply the demand.

Mail Route for Minneapolis

The postal department is contemplating the establishment of an automobile mail service in Minneapolis. In several of the larger cities mail is transported between the various local stations in specially constructed street cars and an effort has been made to come to some agreement with the Minneapolis companies, providing for such a service. The companies' demands are, however, said to be exorbitant and the department officials have declined to accede to them. If the automobile service is installed the machines will be used for collecting the mail, as well as transporting them between the sub-stations.

Davidson Machines Quit

The Davidson war automobile has again fallen by the wayside. Soon after he was passed by the Chicago tourists on their way to Buffalo he became convinced that he could not reach Washington in the time at his command and left the machines at Hudson Lake, west of South Bend. It is said that the indomitable major is not discouraged, however, and will go it again at the earliest opportunity.

Automobiles in the Sahara

The automobile has invaded the desert of Sahara. Several Frenchmen have made trips recently through a large part of the waste country of Southern Algeria with such success that the French government has officially undertaken a series of tests. A project for a regular service of control and revictualing has resulted. The government plans to connect the various oases by

regular lines of automobiles.

Since France's extension of territory has impelled her to spread the boundaries of her African possessions far into the Sahara desert, the problem of keeping open lines of communication and supply has been most serious. At present camels are used to transport the necessary goods and provisions from oasis to oasis and to carry the mails. But it is hoped now to change this.

Camels can go about three days without water, although to be kept in the best condition they should have water every day. Their normal rate of travel is from three to five miles an hour, although the best dromedaries will make ten miles an hour and keep it up for ten hours a day.

With these limitations the problem of communicating across a desert between points over 300 miles apart has been an extremely difficult one. And farther to the south, where the oases are more remote and the temperature often reaches 133 degrees, the task has been practically an impossibility.

The experiments made have shown that gasoline automobiles can far outdo the camel as a means of transportation in dry countries. Trips of 500 miles in length can be accomplished without great difficulty. Twenty miles an hour is attained in many parts of the desert, and the best speed of the camels can be practically doubled anywhere. Besides this, high temperatures have no effect on the running of the machines, and the amount of goods that can be carried is largely in excess of a camel's load.

In the desert of Sahara there are between 1,500,000 and 2,500,000 square miles. The exact extent of the waste of shifting sands is unknown. A part of it is now open to some degree of civilization, through the long-distance traveling powers of the camels. If the automobiles prove as great a success in the desert as the preliminary experiments promise, another large part of the desert will become tributary to civilized man.

Gash Joins the Searchmont

After five years' connection with the Waltham Mfg. Co., W. D. Gash has resigned the business management of that concern to take the management of the sales department of the Searchmont company. Mr. Gash became associated with the Waltham company five years ago, as manager of its Chicago branch. He was transferred to Boston in charge of the company's business in that district. His next position was that of special traveling man with headquarters at Waltham, and from this position he was promoted to that of general manager, having had, under President Metz, full charge of the business for the last two years. He left the Waltham company Saturday and reached Philadelphia Monday morning.

The Searchmont Motor Co. for the past year has been devoting its efforts almost exclusively to the perfecting of its product. Up to the present little or nothing has been done in the direction of selling, as the company preferred to wait until such time as it could, with confidence, fully guarantee its product. After looking over the entire field of those whose business experience, tact and mechanical ability would fit them for the place, W. D. Gash was selected as the man most eminently suited for the position.

Automobile Route in California

A transportation company doing business between San Jose and Alviso, Cal., has arranged for a number of electric omnibuses to cover the route and expect to have them in operation by the middle of November. The vehicles are to be patterned after the usual type of hotel coach, and afford protection in all kinds of weather. They will be electrically lighted, and will accommodate 20 passengers. The roads to be covered are of the best in California, and it is expected that these machines will be able to reduce the time from Alviso to San Jose by one-half. The principal object of this particular line is to make connections between the surrounding points and a boat leaving San Jose for San Francisco.

Way for the Automobile

From the Jacksonville (Fla.) Citizen: It is never too early to begin a good work, and the sword is best forged when the iron is hot. Another winter must supervene before the people of Florida are entirely to begin work on one particular project that should be of interest to all of us, but, meantime, our minds should be prepared and everything made ready. We have had our hands full during the past summer, for the work of rebuilding our chief city, restoring our capitol and preparing for the fair was

laid on our shoulders, in addition to ordinary duties; yet we may contemplate a time in the near future when these will be off the anvil.

Then we should forge a sword that would cut away all the difficulties in the way of a circuit composed of good country roads that would bring the automobiles of the wealthy to our state for the winter, as well as the bicycle of the average American. These vehicles are now running a race from New York to Buffalo by way of testing the endurance and practical worth of the different machines; as soon as the winter comes they will be carefully housed, unless it is decided to take them to California or Florida. For this winter we are out of the running, but we could easily prepare ourselves for the winter of 1902.

Publish to the world that automobiles can safely spin from Jacksonville to Palatka, Sanford, Orlando, Tampa, Ocala, Gainesville and back to the point of beginning—would they not come to us? Should not Tallahassee and intervening towns give us another circuit or long-distance track? What says Pensacola?

The owners of automobiles are those who have the power to develop our state—their mere presence would insure inns along the way that would double the value of all adjoining lands. The farmers need the roads in their business, the landlords must have them, the merchants would be benefited and the tax books would show an immediate profit. What say the Boards of County Commissioners? Those who make the roads will get the travel. Why should not Florida make herself the winter home of the automobile? Delay will send them elsewhere, and it is hard to divert a stream from an old channel—it is not too early to say what shall be.

Mitchell Motor Bicycle Tests

The Wisconsin Wheel Works, of Racine, Wis., is devoting every possible effort to making its Mitchell motor bicycle as nearly perfect as possible. Before attaching to the frame every motor receives a factory test, after which the complete machine is given a trial upon a quarter-mile cement track and later on is put on actual road work. It is safe to say that every Mitchell motor bicycle is run 100 miles on the track and road before it is sent to the purchaser. The illustration shows some of the officials of the company and the testing crew. The company has just received an order from its English agents for a full nickel-plated machine, to be exhibited at the Stanley show. This will be gotten up regardless of cost, to show the highest possible workmanship and finish. The English representatives, Davis, Allen & Co., have already placed large orders with the Wisconsin Wheel Works for this machine, and samples already received in London are meeting with great favor.

Perpetual Motion Automobile

A misguided individual has been expending his money on the construction of what is, to all intents and purposes, a perpetual motion machine. The device in question is a motor vehicle, in which the front wheels are driven by a motor, designed to be operated by compressed air, admitted to the motor from a tank conveniently located within the vehicle. Attached to the rear wheel is a series of pumps, which it is intended shall be operated by cam connection with the rear wheels, and thus provide the compression in the tank. To operate this ve-

THE MITCHELL TESTING CREW.

hicle it is the inventor's idea to furnish the initial pressure necessary to start the motor in any manner desired, and it is specifically stated that such means do not constitute a part of the invention. After the vehicle is thus started it is presumed that the above menioned pumps will furnish the pressure necessary to run the carriage under any and all conditions! We would be sorry to hurt the feelings of the no-doubt enthusiastic inventor, but would suggest that sometime when he has a little spare time at his disposal he retire to the privacy of the back yard and try to pick himself up by his boot straps.

Chicago Races Abandoned

The Chicago Automobile Club has been reluctantly compelled to abandon its plans for a race meet in October owing to its inability to secure Washington Park for either the first or second Saturday. If a suitable track can be secured club races will be held at some other place.

An Automobile Bank

The latest freak of the French automobile enthusiast is a traveling bank. The authorities of Mezieres, wishing to encourage thrift among the peasants, have had built to their specifications an electric motor-car containing four seats, one for the driver and three in the rear around a small table. Folding shelves are so arranged as to make a convenient desk for a person standing beside the vehicle. Under the table is a small safe, and conveniently arranged in other parts of the vehicle are the various paraphernalia incidental to the purpose for which the vehicle is used. The passengers are two clerks from the local treasury department and a cashier.

The car travels about the country, making short stops in the villages on prearranged days, and receiving such sums as the citizens or farmers of the neighborhood may wish to deposit. As yet this innovation has received no very enthusiastic support from the rural population, but as they are not overly prompt in the absorption of new ideas it is too early to even guess at the ultimate result.

The government of the Congo Free State is about to establish an automobile service between Stanley Falls and Redjof, a distance of 620 miles. A railway connecting these two places was begun considerably over a year ago. Less than 60 miles has been accomplished, and it has now been determined to abandon the plan and substitute motor carriages. In the place of the railroad a well-surfaced road way is to be constructed. It is expected that the automobiles will be installed within the year, and if the service proves successful it will be extended from Redjof to the Nile.

On Saturday last two French chauffeurs drew up at the Lenox, Buffalo, with Vanderbilt's Red Devil and Foxhall Keene's Mors. They were evidently disappointed on receiving instructions from their employers, who had gone to New York, to return to that city at once. The machines were objects of great curiosity during their brief stay, but the common comment was that they were not nearly as ferocious appearing as the reports of them indicate.

The Jamesville (N. Y.) Mfg. Co. has been absorbed by the I. A. Weston Co. The Jamesville company made bicycle and automobile parts, but had not the facilities to do a big business, so wisely concluded to join forces with Mr. Weston. Mr. Land, who was secretary of the Weston company, recently withdrew through poor health and his place, financially and commercially, was at once taken by H. Romaine Smith.

F. Worthington Butts, a Buffalo photographer of repute, made a run from Erie to Buffalo last week and, according to his account of the road, it is perhaps as well that the 100-mile race did not take place. Mr. Butts says that in places the road is almost impassable and that speed would have been impossible. He made the distance with his 12-horsepower Packard in 9 hours and 15 minutes.

It is rumored that if the Erie-Buffalo race had been run it would have been done at the risk of incurring the wrath of the people of North East, an insignificant village on the route. The township commissioners held a meeting and refused the necessary permit. Whether they were induced to alter their minds later, has not been reported.

There is a demand for automobiles in Portugal, where there are but two up to the present. The vehicles which are required are those which will carry at least four persons, and are able to do strong hill climbing work. The maximum speed must

not be over 26 to 28 kilometers—less than 20 miles—and the price must not be above $1,000. The Portuguese must wait.

H. E. DeLoura, of the DeLoura Mfg. Co., Rochester, makers of automobiles and gasoline motors, has withdrawn from that concern, which is now controlled and managed by Frank P. Crouch, who has backed it financially. Mr. DeLoura is going west, and has in view the establishment of an automobile factory in Ottumwa, Ia.

The Western Navigation Co., whose steamers run to Alviso, Cal., and there connect with buses for San Jose, has ordered six electric buses and expects to have them running by the middle of November. Later on the company will extend its service and establish a line of steam wagons to carry freight between the same points.

An incident which will not occur again, was seen at Copenhagen not long ago. The king of Greece, the prince of Denmark and a German prince, all in automobiles, and the czar of Russia, the Princesses Maud and Victoria, and Prince Nicholas of Russia, on bicycles, took a ride in the gardens of the Palace of Denmark.

On Friday of last week Alexander Fisher made a fast run between Buffalo and Niagara Falls. He was accompanied by three friends. They left the exposition at 10 o'clock and completed the journey inside of 39 minutes. The machine was one of those which went through the endurance test the previous week.

W. C. Green, of New York, is said to have paid Charron $15,000 for a Panhard machine which finished second in the race from Paris to Berlin. The new owner does not aspire to become a racing man but has offered to lend his machine to a prospective competitor in the coming 100 mile race.

The latest feat of the automobilist is that of a German, who has recently succeeded in crossing the Alps on a machine, driven by a benzine motor. He traveled from Frankfort to the Italian side by way of the Brenner pass, experiencing no great trouble in doing so.

On complaint of the Twin Town Mfg. Co., which has a claim of $7,500, a receiver has been appointed for the Automobile Mfg. Co. of Maryland, a concern which, according to report circulated, about six months ago, was expected to develop something remarkable.

Several buildings have been added to the Riker plant. They are described as follows: Carriage finishing building, 2-story brick, 65x200 feet; repository building, 2-story brick, 35x100 feet; battery building, 50x75 feet, brick 1-story stone.

The Rhode Island Automobile Club is to hold a race meet on Oct. 10, the same date as has been selected by Detroit. It would be a pity if the available competitors were to be divided by this clash of dates.

The statistician is already at work among automobilists. He finds that Brattleboro, Vt., has one automobile for every 630 inhabitants.

Leipzig, one of the largest cities in Germany, has fifty-two automobiles so far as police reports state.

HOW TO MAKE AN INDUCTION COIL

Although the jump or secondary spark is becoming an important factor in the successful operation of gasoline automobile motors, many persons, even among those using it are entirely unfamiliar with the principle of operation and interior construction of an induction coil. There are many coils on the market, some bad, others fairly good, and a great many indifferent, but the writer knows of no American-made coil which will stand up under any or all conditions of use to which it may be subjected. Some manufacturers have developed coils by experiment, others by buying some coil already on the market, dissecting it, and duplicating it as nearly as possible. Still others have had some nearby electrician or other person engaged in such work, make coils for them, because of a growing demand for the same, without knowing whether the coil was good or bad, or, in short, anything more about it than that it would give a spark when connected to a battery of sufficient strength.

EFFECT OF COMPRESSION.

One of the first and most important factors to be considered in purchasing or building an induction coil, is the compression carried by the motor, in connection with which the coil is to be used. An induction coil which will give a ¼-inch single break spark between its terminals in the open air will scarcely jump 1-16-inch in the explosion chamber of a gasoline motor carrying 50 to 60 pounds compression, while at 75 to 90 pounds pressure it would not jump at all. As the general trend of gasoline motor construction is toward higher compression, the failure of many attempts to use the jump spark successfully may be traced to this result.

An induction coil is made up as follows: The coil consists of a bundle of soft iron wire. Around this is wound, running from one end to the other, insulated copper wire, of from No. 20 to No. 10 B. & S. gauge, generally two or three layers, known as the primary winding. Around this is wound a large quantity of insulated copper wire of much smaller diameter, anywhere from 2,000 to 20,000 feet, depending upon the required strength and use of the coil, as for medical, thermo-electric or X-ray use.

HOW THE COIL OPERATES.

When a current of electricity is caused to pass through this primary winding for a short period of time, magnetic currents, or lines of force as they are more commonly called, are caused to flow through the core. These lines of force induce a current of electricity in the small, insulated wire, which is around the primary or larger wire. If the electric circuit, applied to the primary wire be suddenly broken or interrupted, the magnetic current flowing through the core is suddenly reversed and before reaching its neutral or normal condition, causes an induced current of electricity to flow both in the primary and secondary windings. The current thus induced is of great intensity, and jumps the break in the secondary circuit at the points of the spark plug, thus producing a spark. The negative or self-induced spark is of much greater heat than would be caused by making and breaking the battery circuit alone. The primary spark is usually of a reddish yellow color if a battery of large current strength is used, while the secondary is of a bluish white.

THE METHOD OF WINDING.

One of the principal reasons of induction coils failure is the manner of winding the secondary wire. There are three methods in general use. First, and best, is that of using single or double insulated copper wire, wound in consecutive layers along the core, over the primary winding, without other insulation; second, winding bare copper wire, alternated with a strand of cotton thread of about the same diameter as the secondary wire, tissue paper being used between every layer of wire in the coil; third, winding bare wire upon the coil, by means of a screw feeding device which keeps the turns about 1-16-inch apart, and insulating between each layer with paper, as in the second method.

The first method can be used successfully up to certain limits, but if a high voltage

or tension is required of the secondary, the wire must be large and must have the best double silk insulation for covering, and every layer in the secondary coil must be insulated very thoroughly. This means a coil of mammoth proportions and great cost. To obviate this, some manufacturers immerse the entire coil with some so-called insulating compound to prevent disrupting of the secondary winding, when used for a higher tension effect, that is, to produce sparks of greater length than the capacity of the coil justifies.

ACTION OF THE CONDENSER.

A not to be neglected factor is the condenser, a device made up of alternate layers of tinfoil and paper, and used first to assist in lessening the corroding and erosive action of the induced primary spark upon the platinum contacts, and, second, to assist the primary winding and iron core to quicker action. A condenser has similar action with regard to an induction coil, as a Leyden jar has to a plate glass or Terranti type of static electric machine. In this type the Leyden jars, which are simply ordinary bottles coated inside with tinfoil, and having a brass rod passing through an air tight stopper in the mouth, with a ball upon its outer extremity, are charged by touching the ball with one of the contacts or terminals of the static electric machine while it is in motion. The jar becomes highly charged with electricity with which it readily parts when placed in contact with some object which has a greater electric affinity than itself; or it may be used to charge the static electric machine with on starting up, to more quickly bring it to a high state of tension or potential. In the induction coil the condenser receives the surplus portion of the induced current generated in the primary winding, which is generated in it, by the negative or retrogradive action of the magnetic currents or lines of force in the iron core, of the coil.

A COIL IN SECTIONS.

Figure 1 shows a side sectional elevation of a form of induction coil made and used by the writer with better results than any other. The secondary wire is wound upon small spools of suitable insulating material, hereinafter described. In this manner the total potential of the coil is divided in proportion to the number of spools or sections used as against the more generally used method of winding the secondary wire in one continuous winding of successive layers the full length of the coil. In the latter case the greatest potential exists at the outer layers of the windings of the secondary. Although some differences of opinion exist with regard to this matter, it has been the writer's experience that injury, by

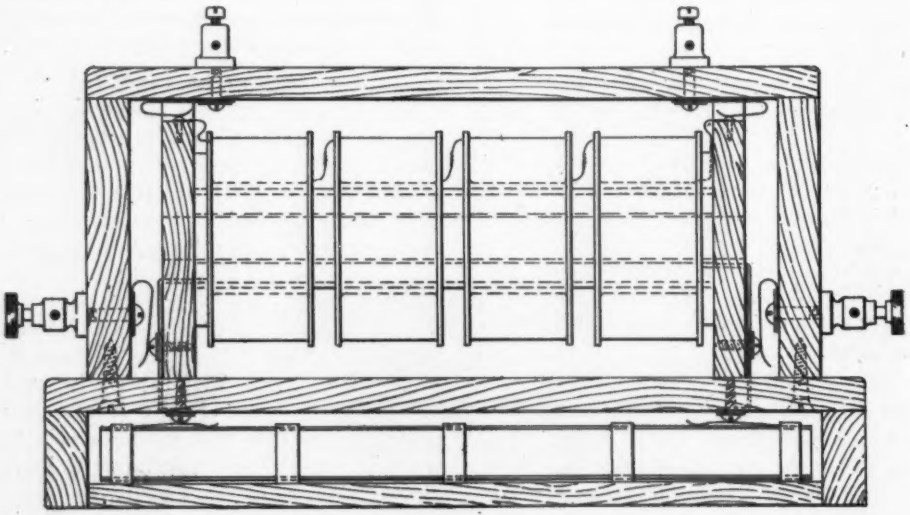


FIGURE 1.
Sectional Elevation of Induction Coil, Showing Primary and Secondary and Condenser Connections.

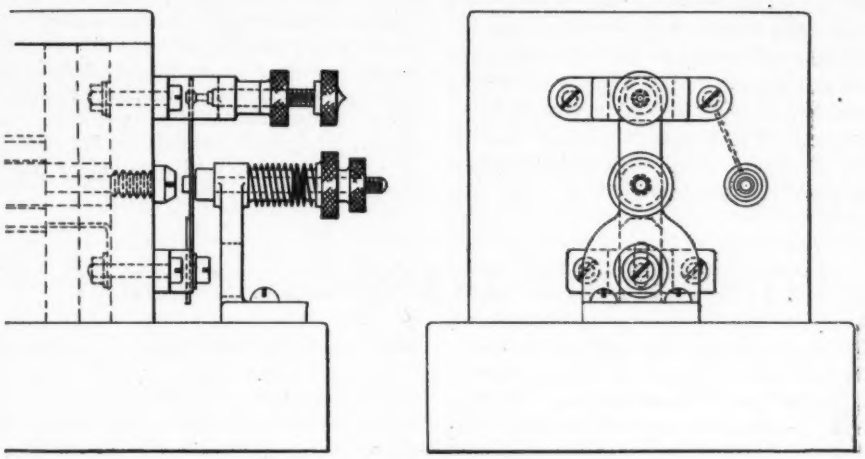


FIGURE 2.
Partial Side Elevation and End View of Induction Coil Arranged for Vibrator.

burning out or disruption of the secondary winding generally occurs in the outer layer or winding. In many tests to settle the question only one resulted in a case of internal disruption near the core, and that was due to a splice in the wire with poor contact at the same. In the form of coil here shown, the outer casing may be removed, by taking the condenser out of its receptacle in the base. After removing six small screws the cover, with binding posts and contacts, is easily taken off. This form of coil can, of course, be made with fixed connections if desired, the same as the ordinary coils. It only takes a little longer time and a few small pieces of spring brass. A departure from this plan means the breakage of the inner end of the secondary winding, when removing the coil from its casing, or the casing from the coil, through having to pull this exceedingly small wire (from .005 to .0079 in diameter) with its correspondingly delicate insulation through a small hole, at right angles to the direction of the separation of the coil and casing.

In Fig. 1 the induction coil shown is of the plain jump or single break type, which is most generally in use, and coming more into use in preference to the primary or make and break contact form of spark coil without secondary winding.

Figure 2 shows this type of coil, arranged to use with vibrator or automatic electro-magnetic make and break. For testing out sparking plugs, insulations, etc., this coil has no equal, but is not to be preferred to the plain, single, or mechanical break form or coil, which is less liable to get out of order.

A table is attached, giving the general measurements and requirements of four sizes of this type of coil from ¼ inch to ⅝ inch single break spark or for from ½ inch to 1¼ inch vibrator spark.

A full description of the construction of this coil, together with complete illustrations of the details of spools, case, connec-

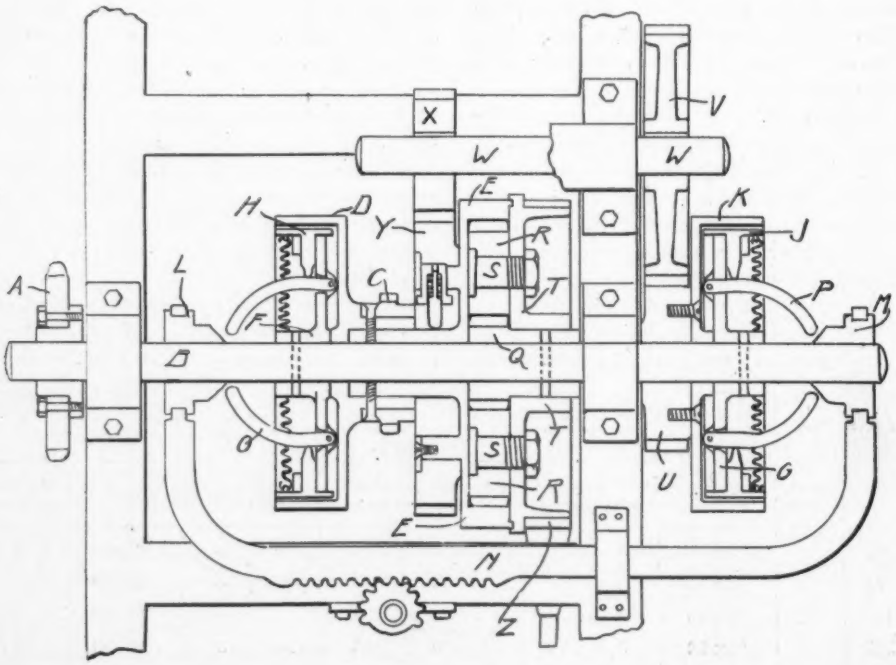
Length of Spark.		Diameter and Length of Iron Wire Core.	Windings.				Primary.		Secondary.	
			Primary.		Secondary.					
Vibrator.	Single Break.		No. of Layers	B. & S. Gauge.	Length in Feet.	B. & S. Gauge.	Volts.	Amprs	Voltage.	No. of Sect'ns
⅛	¼	⅜ x 6	3	18	5,000	36	4	3	20,000	3
¾	⅜	½ x 8	3	16	7,500	36	6	4	30,000	4
1	½	⅝ x 10	3	14	9,500	34	8	4½	40,000	5
1¼	⅝	¾ x 12	3	12	12,000	34	10	5	50,000	6

tions, etc., the details of the vibrator form of this coil, details of a few interesting experiments which may be performed with the same and the way to test a jump spark plug insulation with it, will be published later. This form of coil herein described was devised after several years of experimenting, and gives the best results of any the writer has ever used. If some form of vibrator or interrupter contact could be devised which would not corrode, it would make any gasoline motor, stationary, marine, or automobile, give more than ordinary results, as it gives a succession of heavy, fat sparks; but alas for the weakness of human ingenuity, that is only a passing dream.

THE FRANTZ TRANSMISSION GEAR

Hiram A. Frantz is a resident of Cherryvale, Pa., who divides his attention between the occupations of a minister, an inventor and a manufacturer of automobiles. He makes among other good things a transmission gear of promising appearance. The appliance has two forward speeds and a reverse. The operation is simple, the forward speeds being obtained by throwing in and out of gear two clutches at opposite ends of the device, while the reverse is obtained by applying a band-brake by means of a foot-lever while both of the clutches are out of action.

In the illustration is shown a sectional plan of the transmission gear and that part of the running-gear on which it is mounted. Attached to the main-shaft of the engine is a sprocket wheel, having chain connection with a sprocket A, which is attached to the main shaft B, of the transmission gear. On this shaft is a sprocket wheel C, from which runs a chain to the differential on the driving-axle. The sprocket C, is fixed to the over-lapping hubs of a clutch-wheel D, and an interiorly toothed wheel E, which are loosely mounted on the shaft B and are united by the said sprocket-wheel C, so that all will rotate together. Fixed to the shaft B, adjacent to its opposite ends, are similar hubs F and G, carrying radially-slidable friction shoes H and J, either of which is adapted to be forced outward into engagement respectively with the clutch-wheel D,



or to the similar one K, by means of one or the other of the sliding conical sleeves L and M, which are moved jointly upon the shaft D by means of a suitably operated connecting rod N, so as to spread either of the clutch operating levers O or P, according as the direction of the movement is toward one or the other. In addition to these clutch-hubs F and G, there is also fixed to the shaft B at an intermediate point, a pinion-wheel Q, which meshes with a series of planet wheels R R, loosely mounted upon axes S S, and also meshing with the internally toothed wheel E. These axes S S, and the planet-wheels thereon are carried by a brake-band wheel or drum T, which is loosely mounted upon the hub of the pinion Q. The loosely mounted clutch-wheel K, carries a toothed wheel U, which meshes with a wheel V on a counter shaft W, and another wheel X on the latter meshes with an externally toothed rim Y, which is rotatably mounted upon an annular projection on the internally toothed wheel E, with which it has a pawl and ratchet engagement, and whereby said wheel E may be rotated by it in one direction only.

The mechanism for operating the conical sleeves L and M, to throw one or the other of the clutch-wheels D or K into gear with the shaft B, consists of a vertical shaft rotatably mounted on a standard secured to the running-gear, and provided at its lower end with a fixed pinion adapted to mesh with a rack formed on the connecting-rod N. At the upper end of this vertical shaft is secured a suitable lever, whereby the shaft may be rotated in such manner as to throw the clutch-wheels D or K, into gear with the shaft B, as desired.

The operation of the speed regulating and reversing mechanism is as follows: When the lever attached to the upper end of the vertical shaft is in middle position, the clutch-sleeves L and M, are inoperative. The shaft B, will be rotated by the motor without rotating either of the clutch-wheels D or K. The pinion Q, however, operates upon the planet-wheels R R. The effect produced by this is dependent on whether the brake-band wheel T to which are secured the axes S S, on which the planet-wheels are mounted, is free to rotate or not. If the brake-band Z is loosened so that the wheel T is free to rotate then the said wheel may be idly rotated without effect upon the internally toothed wheel E, or the sprocket-wheel C. If, however, the brake-band be tightened so as to prevent the rotation of the wheel T, and of the axes S S of the planet-wheels with the shaft B, then the said planet-wheels will be rotated on their axes and the internally toothed wheel E, is rotated thereby in a reversed direction to that of the shaft B, as is also the sprocket-wheel C, and consequently, the driving axle of the vehicle thus propelling the latter in a backward direction.

During this reverse operation the pawls carried by the internally toothed wheel E, engage the externally toothed ring Y, which thus rotates the shaft W and its accessories idly, but during the normal forward movement effected through the clutch-wheel D, this toothed ring Y, and the parts in gear therewith, are not rotated at all. If the rack rod N, be moved to the right, throwing into action the clutch-wheel D, the sprocket-wheel C, will be directly rotated with the shaft B, at the same speed as the latter. If, however, the rack rod N, be moved to the left so as to throw the clutch-wheel A, into action, the sprocket-wheel C, is rotated at a slower speed than the shaft B, the latter operating upon the said sprocket-wheel C, through the counter shaft W, and the toothed ring Y, which latter then engages the pawl of the toothed wheel E, and carries with it this wheel, together with the attached sprocket-wheel C. The planet-wheels, which are in mesh with the wheel E, and the pinion U rotate idly around the shaft B, with the loose wheel T, the latter being held against free rotation by the brake-band Z, only when both clutches are out of action and it is desired to run backward as already described. Thus it will be seen that by means of the lever attached to the vertical shaft the operator is enabled to gear the sprocket-wheel C for either fast or slow forward motion, or when this lever is in its middle position to let it run idly, or, in connection with the brake-band C, and the foot-lever by which it is operated in reversed direction

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The Sargent Carbureter

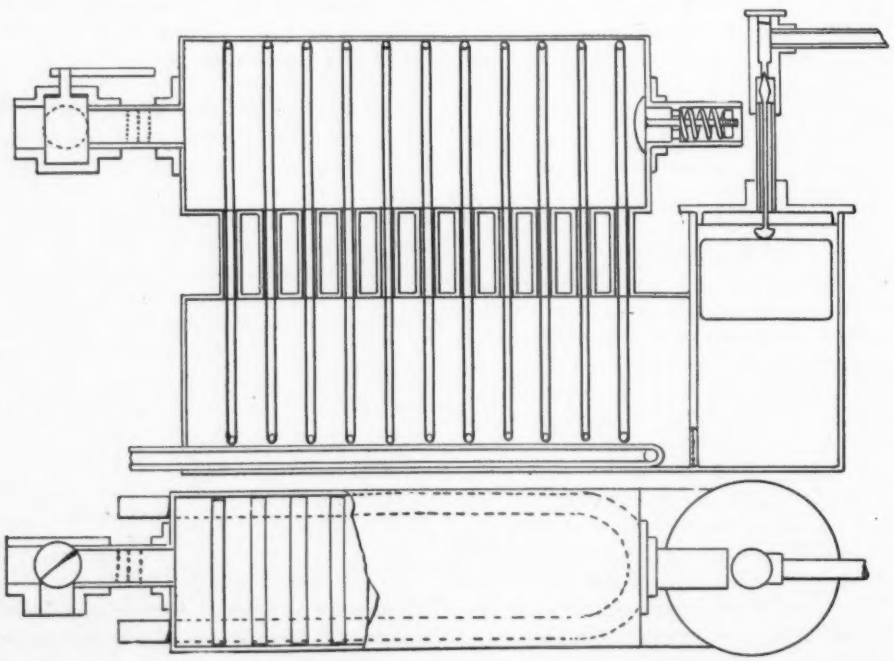
Having encountered various difficulties, apparently unavoidable in the use of the

carbureters on the market, A. C. Sargent, of Lowell, Mass., has developed one which he states has given uniform satisfaction. He states that the quality of the gas is easily and quickly controlled and that it is impossible to flood the pipes or engine no matter on what incline the carriage may be running. This carbureter comprises three chambers, and in the order in which the gasoline passes through them the first is a supply chamber, containing a float which regulates a needle-valve. The needle portion is a separate member, upon which the float rests when the gasoline has reached the desired point, and is not rigidly attached to the float. The second chamber is designed to hold a quantity of gasoline, which enters through an opening in the wall between that and the supply chamber, this opening being provided with a wire screen. Along the bottom of the last, or supply chamber, passes a loop of pipe, through which may be passed a portion of the exhaust vapors. Above this supply chamber and completely separated therefrom, except through the communication established by a series of wick-tubes, is the vapor chamber. Were the chambers separated only by a screen any considerable inclination or violent motion of the vehicle would cause the gasoline to flood the vapor chamber. By making the wick-tubes of considerable length no motion occasioned by ordinary use is suffcient to throw gasoline into the vapor chamber. The wick-tubes extend across the entire width of the vapor chamber and each contains a broad wick. The arrangement of these is that of endless bands passing over rods at the top and bottom of the vapor chamber the gasoline receptacle respectively. The function of the wicks, as will be readily understood, it to take up gasoline from the lower receptacle and convey the same by capillary action into the vapor chamber, whence it is drawn by the aspiration of the engine.

To provide for the admission of air to the vapor chamber an inlet-pipe is located at one end. The vapor-outlet is opposite the air-inlet and is provided with the usual screens. This outlet-pipe leads to a mixing-valve, having an air-inlet set at right angles to the vapor-inlet and an outlet leading to the engine. The mixing-valve is a three-way valve of the familiar type.

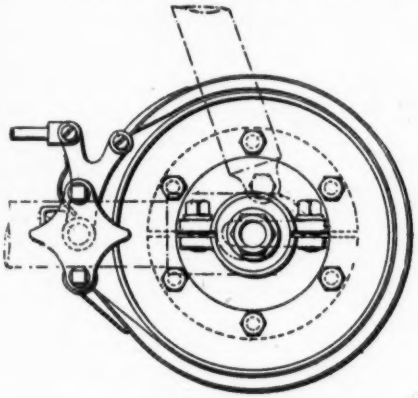
A Band-Brake Attachment

J. H. Punchard, a bicycle manufacturer of London, England, has recently designed a band brake attachment to be applied to any ordinary bicycle hub. The device consists



of a flanged collar made in two parts and clamped on that part of the hub usually extending behind the spoke flange at the side of the hub opposite the sprocket, and a brake drum with a flat periphery, to be bolted to the flange of the collar above described.

The brake-band mechanism consists of a



bell-crank pivoted to a clamp secured to the frame. Operated by this bell-crank is a brake-band which may be of any desired construction. An operating lever of any desired form is attached to the handle bar and connected with the bell-crank in any desirable manner.

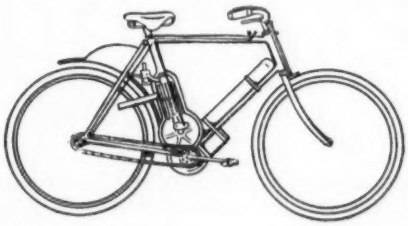
Another Spring Wheel

Another spring wheel has been presented by Samuel Hamblen, of Hot Springs, Ark. While its value is doubtful, it has at least the advantage of being more presentable than most devices of the kind. The wheel is built up in the usual way and has a flat steel rim. Outside this is a slightly larger one, in which is seated a solid rubber tire. The inner metal rim is perforated at suitable intervals, and passing through the perforations are metal bushings, provided at their outer ends with a head and exteriorly screw-threaded at the inner end. A nut is fitted to the threaded portion of the bushing and this nut is also threaded upon its periphery to fit the interior screw threads of a cylindrical cup. Secured to the outer rim is a number of bolts, adapted to pass through the bushing. Surrounding the bolts and seated against the nut attached to the inner end of the bushing are helical springs, the other end of which bears against a nut secured to the inner end of the bolt. This nut may be adjusted to regulate the stress of the spring according to the load to be carried by the wheel.

The Hafelfinger Motor Bicycle

Of the exhibits at the Madison Square Garden cycle show last February, one of the most favorably received was the Hafelfinger motor bicycle. This machine was designed by E. P. Hafelfinger, of Weehawken, N. J., and is now manufactured by the Royal Motor Works. It has several features which set it apart from the general run of motor bicycles. In the first place it is really a motor bicycle, and not merely a bicycle with a motor attachment. The frame, which is specially designed, resembles the regularly accepted type of diamond frame, the variation therefrom being principally in the seat mast tube. This member comprises a tubular portion at the upper end serving as a socket for the seat post, and holding a series of four curved tubes which connect at the lower end with the bottom bracket, forming, in their entirety, a seat for the motor.

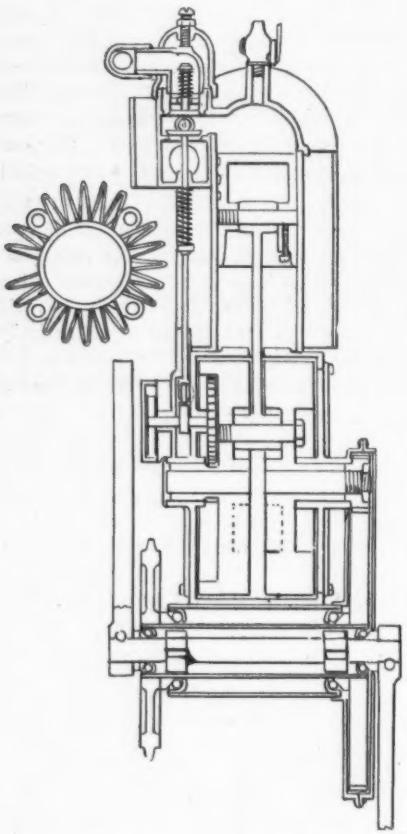
The motor itself has many distinctive features, the most readily noticeable being the cooling device. Instead of the usual annular flanges a number of longitudinal flanges are provided, the arrangement of which may be readily understood from Fig. 1, in the accompanying illustration. These flanges are open at both top and bottom, permitting a ready circulation of air. The valve-chamber is provided with similar flanges, as is also the cylinder head. By



the arrangement of the crank case, main bearings of substantial proportions are provided, while the width of the motor is kept down so that it may be set between the cranks without unduly widening the tread. The crank-shaft proper is mounted within a hollow sleeve and is provided with a friction clutch for rotating said sleeve forward, but allowing the sleeve to so rotate free of

the shaft, when desired. On this sleeve, which is supported by ball-bearings within the hanger bracket, is mounted at one end the sprocket-wheel for receiving the driving-chain; at the other end is the spur-gear, meshing with a pinion on the motor-shaft, thereby providing for the driving of the rear wheel. Both the pinion and gear are surrounded by an oil-and-dust-proof case, which gives the whole a neat and compact appearance.

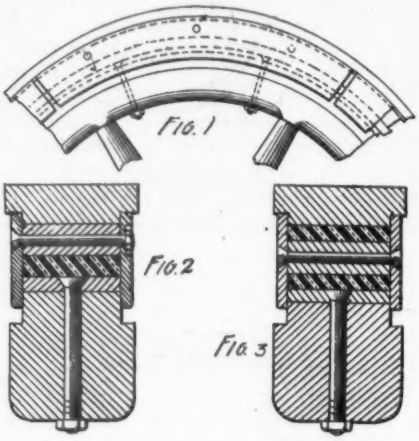
The location of the various accessories



is arranged with a view to rendering them as compact and unobtrusive as possible. The gasoline tank is supported by the rear stays, between the rear wheel and the saddle. The carbureter, of special design, is located directly over the rear wheel between the gasoline tank and the engine. The various controlling devices are operated by levers conveniently placed near the front of the upper frame-tube. The muffler is extremely small and extends from the exhaust-valve rearwardly along the rear wheel. Taken in its entirety, the machine is one of the best, so far as appearances are concerned, yet placed on the market.

A New Vehicle Tire

W. F. Masters, of Brooklyn, N. Y., has designed a tire in which the rubber is entirely enclosed, and the tread is of steel, closely resembling the steel tire in general use. The rim, which is of the usual pattern of wood wheels, is provided with an annular groove and around it is placed a steel band, serving to securely bind the rim and



spokes. Around the steel band is placed a rubber band of suitable thickness to the load designed to be carried, and around that is a band of wood, preferably thicker than the steel and rubber bands. Then comes the steel band, which constitutes the tread. The separate members are bound by annular metal plates, which are preferably composed of separate sections and are held in place by bolts. In the accompanying illustration Fig. 1 is a side view of a portion of a wheel fitted with the device. Figure 2 is a section of the rim and tire. Figure 3 is a section of a tire designed for heavy loads and having an additional layer of rubber between the wood and the steel tread.

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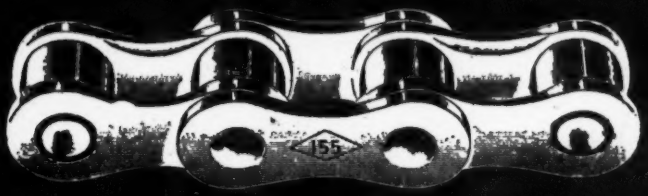

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SUGGESTIONS ON MOTOR CORRECTIVES

By Reginald Wales.

The sparking device on a gasoline motor is always a constant menace to the automobolist's pleasure, and perhaps there is nothing which embraces a greater field of possibility or embarrassing actuality than that which we are about to consider. Details are of such vital importance as to be worthy of the most thorough investigation, and the fact of their being totally disregarded at the most important occasions is frequently the cause of the motorists encountering issues which seemingly defy whatever skill he may be fortunate enough to possess. One thing is more or less subservient to another in the various devices manufactured for producing suitable ignition.

CAUSES OF TROUBLE.

This is forcibly illustrated when we consider the relation the coil bears toward the batteries, or the condition of the points within the cylinder; then again, connections incrustated with verdigris or badly covered with oil—which is a non-conductor—will throw such resistance into the circuit that no battery, however powerful, can overcome sufficiently to force the requisite current through the coil and down into the sparking chamber. It is these things, which seem of such minor importance, that make, to the inexperienced motorist, his pleasure run attended by more or less uncertainty and at all times hazardous. A motor that evinces a tendency to sluggishness has not been necessarily affected by conditions which are in themselves large, an exhausted battery for instance; it is the little things which cast such an impregnable barrier between him and the ideality of his favorite sport. The machine may be rolling along in the most irreproachable manner, but in an instant there is a hitch in the proper working of the engine which grows constantly worse until the motorist finds himself well nigh nude, working in desperation in a broiling sun of a July day.

It is safe to say that when a motor stops, the point which should command first attention is the connections; these, due to vibration of the machine while in motion, are very likely to break or become loosened. A motor which explodes badly, and yet permits the machine to propel itself, is troubled by improper circuit connections, and may be easily corrected by bringing about better contact at the impaired binding post. It is comparatively easy to discriminate between inadequate battery strength and the various faults which would intercept the current on its way toward the ignition points, and thus produce a spark which is wholly unsuited to cause a proper explosion of the gases. It should be first ascertained if the connections are standing normal, and being satisfied upon this point, a battery test should be the subsequent move.

THE INVALUABLE VOLTMETER.

This is best accomplished by means of a gauge which is so small as to permit of its being carried in the pocket much the same as a watch. The instrument is indeed of such value as to make itself indispensable, for any deficient force, caused by localization or general depreciation of a cell or cells, may be unquestionably proven, incurring little or no loss of time in so doing. A proper gauge will show no inaccuracy in its registration, and so may be unhesitatingly depended upon to reflect the true condition of the generative agency, collectively or individually.

It is necessary to be acquainted with the standard output of the battery which is being used, and this in the several various types, is stamped in volts (unit of pressure) and amperes (unit of current strength) either upon the top or side of the jar. If such is not the case, then the normal output is only obtainable directly after having been charged. With the standard requirements in mind, a test of the suspected series will definitely reveal its true working strength, and if the test results in proving them below par, it is a certain indication of deterioration, in

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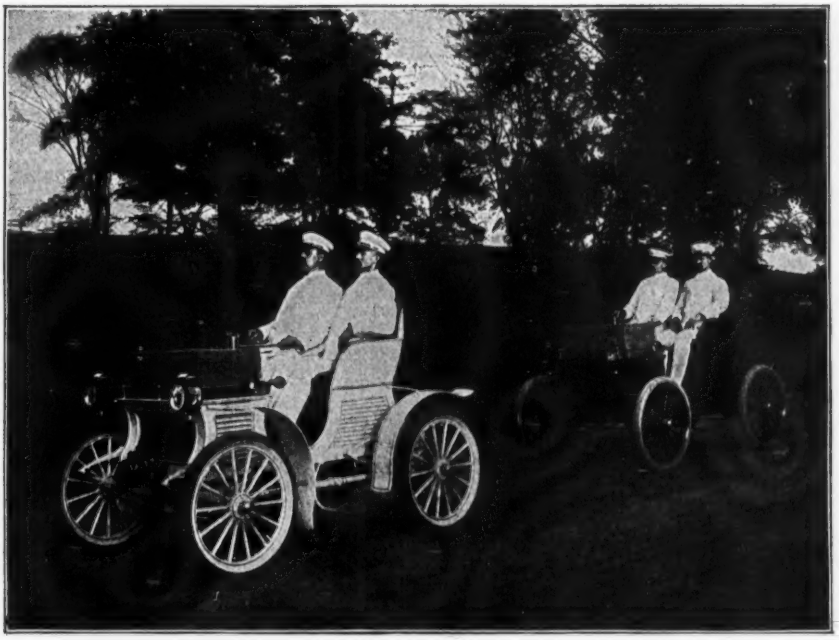

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which state the cells can no longer supply the necessary amperage for ignition.

The fact of the entire series being found inadequate to cope with the demands made upon it is not necessarily caused by the depreciation having taken place in all the cells composing such a series. On the contrary, all may be perfectly satisfactory in their present condition, with the exception of one which, in itself, being unfit for use, will act as an impediment, and so influence the flow produced from the balance as to indicate, in registration on the gauge, the full quota of batteries to be unsuited for further service. It is naturally thought, under such circumstances, that recharging all cells coupled in the circuit, is the only expedient and quite imperative to produce the original output from which the series has retracted. This, however, is totally unnecessary and, moreover, is a needless expense which the motorist inflicts upon himself without due cause. One individual will, in itself, cause the product from the balance which are generating properly, to be so impeded as to make its reaching its destination almost, and in many instances, quite an impossibility, therefore it would, in such instances, register a deficient strength on the gauge. But if this one defective cell be excluded from the circuit, then the point of obstruction and absorption is removed, resulting in much increased registration by virtue of same and satisfactory ignition is deduced from the outcome. Removing from the series the deteriorated cell, will bring about par strength at the gauge minus, however, the individual output of the one cell extracted and general depreciation of the entire series. Proving, by the first test, to be insufficient in strength, each cell composing it should be subjected to an individual test; upon being found sluggish or otherwise unsuitable for the purpose for which it is meant, it may be bridged over. This may permit of your getting under way again.

THE SPARKING POINTS.

Another point well to take up briefly in this article is the condition of the sparking points whose correct condition is quite as vital as any of the other subjects we have touched upon. For its proper working, frequent and careful attention must be given it. We will not discuss here the phenomenon which attends incrustation on the face of the points from the action of the explosion. Suffice to say this actually takes place at uncertain periods of time, and the only way of ascertaining if such a condition is being produced, is by frequent examinations. If the engine is failing in its duty, and there is no room to doubt the generative agency, its connections and transmission wires, then further investigation should be directed toward the inequalities existing in or at the points. If they have become blackened from the action of the explosion, or are found to be worn so that contact is no longer uniform on their respective surfaces, remove them from the cylinder and by judicious use of the file and a little emery paper they may be dressed down until the fault is corrected. It is very often the result of thoughtlessness, and many times no knowledge of the consequences, that the points are allowed to become so worn or incrusted as to diminish the size of the spark or even fail to produce one at all. More attention should be devoted to maintaining a high standard of nicety in their constant working condition, for this is manifestly essential in fulfilling the requirements upon which a well-working motor depends.

The pleasure-bound automobilist sustains more than one break-down during his infantile career, and frequent mishaps mark his progress toward the attainment of perfection in both manipulation and the correction of the existing difficulties; nevertheless, such crucial periods seemingly demand whatever knowledge he has stored up during his day of "contemplation" on ignition irregularities. It is hoped these several suggestions may be of use when the "contemplator" becomes a purchaser and experiences his first mishap. We will close by saying: "Study your motor in its most minute details."

THE RESULTS OF THE

Endurance Test

Furnished an eminently satisfactory proof of the excellence of the White Steam Carriages. **Of four**

White Steam Carriages

which started four finished—an average of 100 per cent.

They were in perfect order—could have turned around and gone back.

The White went through without a halt with less repairs than any other machine in the run.

And this proves beyond contention the perfection of steam as a motive power for vehicles—proves that our application of steam is beyond criticism.

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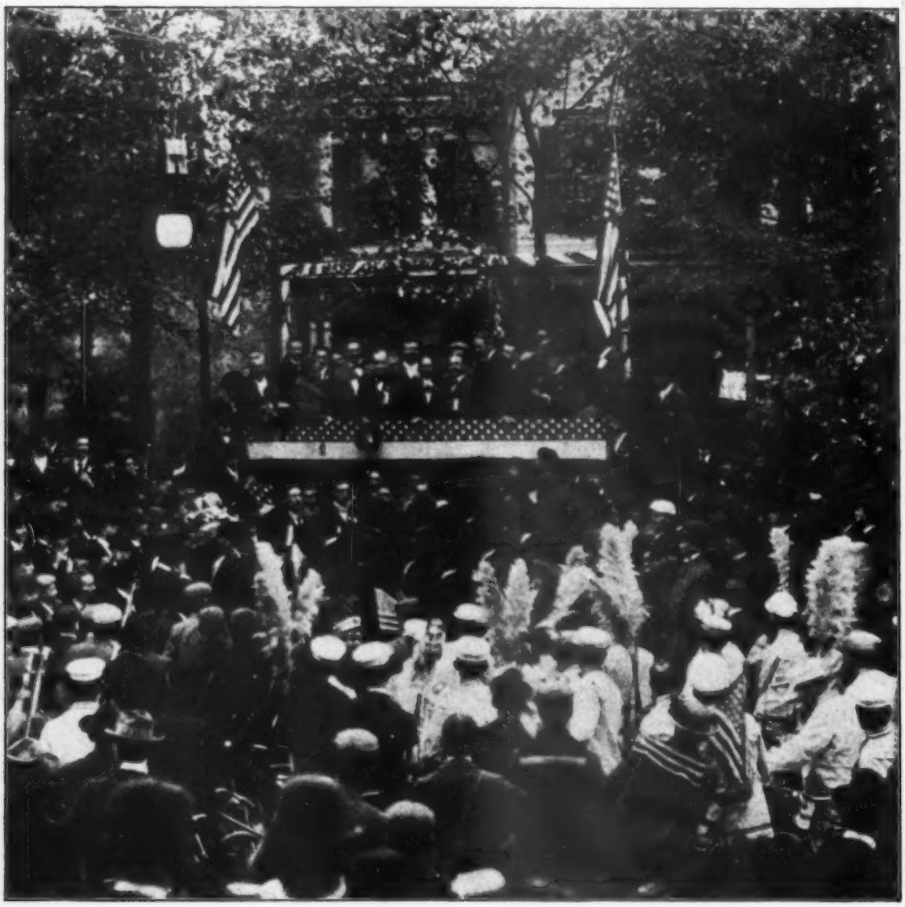
White Carriages are on exhibition and for sale at local branch offices :: ::

PRESIDENT M'KINLEY ADDRESSING THE CYCLISTS AT CANTON



The illustration shows President McKinley addressing the Illinois wheelmen on the occasion of their visit to Canton in 1896. He is standing on the veranda of his home surrounded by a number of then prominent cyclists, among them, on his right, James R. Dunn, president of the L. A. W. A quartette had just finished singing "Illinois" and the president, evidently affected, had remarked: "I have been touched——" when some one shouted: "In his own home, too." The president smiled, the photographer snapped the picture and here is the result. The photograph is copyrighted by J. L. Brouse, 485 Fulton street, Chicago, of whom copies may be obtained.

Stearns

STOOD THE TEST

New York to Rochester, 394.3 miles in 32 hours and 21 minutes.

2nd. prize class B. hill-climbing. Nelson Hill, 4 minutes and 2 seconds. Any one of our vehicles will do the same performance if not better.

Model A. Runabout -	**$ 800**
Model B. Dos a Dos -	**1000**
Model C. Delivery Wagon	**1200**
Model D. Buggy Top -	**875**
Model E. Victoria Top -	**900**
Model F. Surrey - -	**1400**

Immediate Delivery. Agents Wanted. Regular Equipment, Low Water Alarm, Feed Water Regulator. Fire Controlled from the Seat, Air Pump on Engine, Engine Encased, Runs in Oil, Gasoline Generator, Pilot Light, Double Action Brake.

Model A.—Price $800.00

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STEAM CARRIAGE COMPANY

SYRACUSE, N. Y.

THE Only Wheel

Specially designed for Automobiles. Strength, durability, beauty. Fully guaranteed. It has many talking and selling points that will be of use to you. Descript-folder sent free.

MIDGLEY MFG. CO., - Columbus, O.

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Western Sales Office: K. FRANKLIN PETERSON, 165 Lake St. CHICAGO, ILL.

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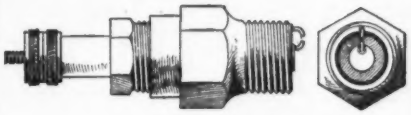


We are making standard ½-inch pipe size plugs for some of the largest manufacturers. Why not you? Write for circular. Price **$2.00 each, $15.00 per dozen.** We are also equipping the best American gasoline vehicles with Dow coils, batteries, etc., also motor cycle manufacturers large and small. Quality counts and our prices range accordingly. No cheap goods of any kind. Now ready for delivery: air-cooled motor castings, 1¼ and 3 horsepower sizes at $12.00 and $25.00. Porcelain insulators 20 cents. Write for circulars on auto supplies of all kinds.

THE P. J. DASEY COMPANY,

160-162 E. Washington St., CHICAGO, U. S. A.

CYCLE SPORT AND TRADE

New York, Sept. 22.—Michael and Eck will probably sail on Thursday for Europe to fulfill engagements made with M. Desgranges for races on the Parc des Princes track in October. Floyd McFarland is to sail with them to engage foreign talent for the six-day race. The party, however, may be delayed until the following Wednesday. Michael's first race is scheduled for Oct. 13 at Paris, where he will ride two races, one at 40 and the other at 50 kilometers. McFarland said yesterday that he was in good condition and would probably do some riding abroad himself. He thought that the much talked of match with Jacquelin at 20 kilometers behind pace would be ridden by him on this trip. He said Kramer would not race abroad before next spring.

Bruyn and Coquelle are keeping the cable warm in an effort to conclude a contract for Walthour to ride seven races in France, Germany and elsewhere abroad this autumn. The pace following season is about over here now, and Walthour is willing to seek fresh laurels and good money across the pond. So he is pretty sure to go.

Kramer Defeats Twenty-Seven

Newark, N. J., Sept. 22.—In a whirlwind finish, after 25 miles of continuous sprints, Frank Kramer won the big open middle distance race at Vailsburg this afternoon, and set new figures for an unpaced competition quarter century. He supplanted the 1:00:28 made by McFarland at Revere Beach, Mass., June 8, 1901, with 58:55 2-5. The start was a flying one, but it has been ruled that in sprint races of 5 miles and upwards there shall be no distinction between the two kinds of starts in allowing records.

Five thousand people saw twenty-eight start, including a fine representation of top-notch sprinters. There was some $350 distributed in prizes, including prizes for each lap and for each intermediate 5 miles.

Constant jumps for the laps kept the field moving at a killing pace. At times one or two would in this way secure long leads, only to be pulled down finally by the pursuing bunch. Kramer set out to win all the intermediate "fives," and captured the first three of them after hard tussles with Nat Butler and Jimmy Bowler. At 18 miles one of the jumps left McFarland, Alexander and Hausman with a big lead. After 2 miles of hard chasing the next bunch caught up; but Kramer was pumped and was forced to let McFarland capture the 20 mile "ten spot." Shortly after this the leaders began to pull away from the bunch, and at 23 miles McFarland, Kramer, Alexander, Bowler, Hausman and Nat Butler had the others beaten off and the race to themselves.

At the bell Kramer led, followed by McFarland. The new champion began his run in the backstretch, with his partner, McFarland, hanging on. Butler came with a great rush on the outside and he and Bowler and Hausman were giving McFarland a tough tussle at the time, when Butler swung up and quit. Kramer won by a half length from McFarland, who was lapped on the inside by Hausman, with Bowler fourth and Alexander fifth, close up. The intermediate times were: Five miles, 11:05 1-5; 10 miles, 22:50 2-5; 15 miles, 34:44; 20 miles, 46:37 3-5.

Rochester Company Retires

The Rochester Cycle Mfg. Co. decided last week to haul down its sign and quit bicycle manufacturing. The company has a nice bank account and figured that the orders in sight did not warrant making a sufficient number of bicycles to make the business profitable. Mr. Benjamin gave these details. The company has not decided whether it will build steam carriages, although it has made twenty, as well as building engines and boilers. It is said that President Kenfield will go into the real estate business. Thus winds up an old, conservative concern. Mr. Kenfield made one of the first bicycles with ball bearings, in the early eighties, and made several trips to England to keep posted on up-to-date construction.

C. J. Connolly, of Rochester, has also made a change. He has resolved to move, and has taken the largest building in Rochester, known as Fitzhugh Hall, and will turn it into an automobile academy. He is already the agent for two automobile concerns. The floor space of the hall is nearly 3,000 square feet and the building is fitted with both gas and electric light and steam heat.

Arend Causes Delirium

Six thousand spectators assembled on September 2 to see the race for the Grand Prize of Germany. They saw the heats won by Ellegaard, Huber, Arend, Schilling, Hinz, Gougoltz, Vanden Born and Mayer. When the final was run on the 7th, there were 10,000 people present. Huber, Ellegaard and Arend won the semi-finals, the Dane making so good an impression that every one regarded him as a sure winner. As usual the pace in the final was slow. One lap before the bell Arend went in front and at the bell gradually increased his speed. Ellegaard made his effort shortly afterward, but too early. Arend responded and kept him going on the outside but despite this the Dane led by half a length in the stretch. Arend, however, was riding on his native heath and was not to be beaten. He regained the lead in the last 50 yards and won by half the width of a wheel. It is rarely that among the stolid Germans such a scene of enthusiasm is witnessed as that which followed. According to eye witnesses it was unprecedented in the annals of German cycle racing. The winner and Ellegaard rode together in a tandem race and won easily, again stirring the enthusiasm of the people. The first prize in the event was $750, second $250 and third $150.

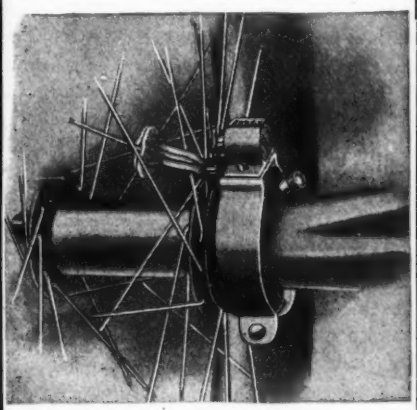
The Midget King

New York, Sept. 18.—Michael beat Walthour four and a half laps in a 15-mile race at Madison Square Garden tonight in 24:32. This was a lap more than he beat Elkes on Monday, and he rode in 11 seconds faster time. The result, and the consummate ease of his victories, seem to establish that behind single pace on a small track the Welsh rarebit is unbeatable. He certainly has improved greatly in form under Tom Eck's care and many believe that the margin of im-

When buying an Automobile see if it is equipped with a

VEEDER ODOMETER

If it is you may feel reasonably certain that its manufacturer pays careful attention to detail and it is a guarantee that he is not exaggerating the efficiency of his motor power or over-estimating his fuel capacity.



Odometer with band bracket Price **$3 50**

The following leading automobile manufacturers have adopted the Veeder Odometer and offer it as a regular equipment without extra charge.

The Locomobile Co.of America, Bridgeport, Conn. The National Automobile & Electric Co., Indianapolis, Ind. The De Dion-Bouton Motorette Co.,Brooklyn,N.Y. The St. Louis Motor Cariage Co., St. Louis, Mo. Milwaukee Automobile Co., Milwaukee, Wis. Electric Vehicle Co., Hartford, Conn., (Gasoline Carriages.) Rochester Cycle Mfg. Co., Rochester, N. Y. The Steamobile Co., Keene, N. H. Knox Automobile Co., Springfield, Mass. Buffalo Electric Carriage Co., Buffalo, N.Y. Foster Automobile Co., Rochester, N. Y. The Kidder Motor Vehicle Co., New Haven, Conn. The Beardsley & Hubbs Mfg. Co., Mansfield, Ohio. The Aultman Co., Canton, Ohio.

The Veeder Mfg. Co.

HARTFORD, CONN.

Makers of Odometers, Cyclometers, Counters, Fine Castings.

Odometer, only price $3 00

Made for 24, 26, 28, 30, 32, 34, 36, 38, 40, 41, 42, 44, 46, 48, and 50 in. wheels.

16-page catalogue free.

provement has been great enough to have put him ahead of Elkes and Walthour outdoors and behind tandem pace as well. Michael certainly deserves consideration in determining the champion pace follower of 1901.

There will be a carnival of racing at the Garden next week, with professional and amateur races of all kinds, as well as motor paced contests between Elkes, Michael and Walthour, concluding with a three-cornered match with this trio as contestants.

Midget Michael Again on Top

New York, Sept. 21.—Three big professional races—a 5 mile open, a match at 5 mile heats between Michael and Walthour, and a mile handicap—drew 5,000 people to Madison Square Garden tonight. Owing to a puncture to Walthour's tire in his warming up spin the paced races were not run off until the close of the programme. In the first heat Michael caught Walthour at a half mile and was a lap ahead at a mile and a half. Walthour put up a hard fight to the finish; but was beaten by a lap and a quarter in 8:01 4-5, the last mile being ridden in 1:33 1-5.

The second heat resulted in a nip and tuck battle, with Walthour a trifle in the lead for 2 miles. The southerner then lost his pace and Michael ran away with the heat and race in 8:04 4-5. In this heat the single motor paced indoor record was beaten the first two miles, the mile being ridden in 1:33 2-5 and the 2 miles in 3:06 4-5.

Four trial heats at a mile supplied the contestants in the 5 mile open, Freeman, Collett, Kramer, Fisher, McFarland, Nat Butler, Bowler and Wilson qualifying. Single pacemakers were put in every mile in the final and time approaching the competition record of 10:15 was the result. It was a great contest. At 4½ miles Kramer went to the front; but the next lap Nat Butler sprinted from the rear and took the lead. Three laps from the end McFarland made his effort. He and Kramer set sail for Butler and passed him on the back stretch of the last lap. Kramer won by a length from McFarland, with Nat Butler third, Wilson fourth and Bowler fifth. The time was 10:34 3-5.

Nat Butler, who is lately showing an almost complete return to his old form, won the mile handicap in 2:01 1-5 from the 100 yard mark, with Leander (100) second and Collett (35) third.

Handle-Bar Drive

Assisting the propulsion of a bicycle by some means of applying power to the handle bar is an old idea. The latest is that of D. E. Norton, of Hampton Hill, England. He obtained an English patent on a similar device about five years ago. The handle bar is not attached to the ordinary stem, but is attached to a separate pillar, pivoted to a rearwardly extending link member, pivotally attached to the handle bar stem in such a manner as to provide for vertical motion. When in its normal position the bar rests on a seat formed on the top of the stem and is locked in position by an upwardly projecting lug which enters a slot in the under side of the bar. The handle-bar is divided transversely in the center; that is to say, it is formed of two separable parts which are slidably mounted in a sleeve secured to the outer end of the pillar. In this sleeve is the slot for receiving the lug on the stem when the bar is in the position of rest. In the lug is a transverse hole and the inner end of one of the halves of the handle bar is provided with a pin which passes through the hole in the lug and into a hole properly located in the inner end of the other half of the bar, thereby locking the bar in position. The power is finally applied to the front wheel by means of a clutch actuated by a cord running over a grooved pulley located on the handle-bar stem to the bar. This clutch is provided with a spring which rotates it in a backward direction when the handle-bar is returned to its normal position thus taking up the slack in the cord. To operate this device the handles are first moved outward which releases them from the lug, after which they are pulled in an upward and backward direction.

Motocycle Records

The chairman of the National Cycling Association has just issued a neat little hand-book of cycle records from which the following, relative to the best records on motocycles of all classes is taken:

A Blue Ribbon Record

New York to Peekskill	$44\frac{6}{10}$	miles	2	hours, 47	minutes
Peekskill to Poughkeepsie	$39\frac{8}{10}$	"	2	" 15	"
Poughkeepsie to Hudson	$41\frac{3}{10}$	"	2	" 37	"
Hudson to Albany	$34\frac{1}{10}$	"	1	" 49	"
Albany to Fonda	$44\frac{6}{10}$	"	2	" 38	"
Fonda to Herkimer	$37\frac{7}{10}$	"	3	" 23	"
Herkimer to Oneida	$38\frac{3}{10}$	"	2	" 45	"
Oneida to Syracuse	$26\frac{8}{10}$	"	2	" 16	"
Syracuse to Lyons	48	"	4	" 16	"
Lyons to Rochester	$39\frac{2}{10}$	"	3	" 32	"
Rochester to Batavia	$33\frac{4}{10}$	"	2	" 30	"
Batavia to Buffalo	$36\frac{5}{10}$	"	2	" 5	"

STEAM

WE INVITE COMPARISONS

Foster Auto Mfg. Co.

ROCHESTER, NEW YORK.

MOTOR BICYCLES AGAINST TIME.

One mile, 1:22 1-5, T. W. Butler, Buffalo, Aug. 17, 1901.

Two miles, 2:47, G. M. Holley, Buffalo, Aug. 13, 1901.

Three miles, 4:11 3-5, G. M. Holley, Buffalo, Aug. 13, 1901.

Four miles, 5:38, G. M. Holley, Buffalo, Aug. 13, 1901.

Five Miles, 7:05 4-5, T. W. Butler, Buffalo, Aug. 17, 1901.

MOTOR BICYCLES, IN COMPETITION.

One mile, 1:25 4-5, G. M. Holley, Buffalo, Aug. 16, 1901.

Two miles, 2:50, G. M. Holley, Buffalo, Aug. 16, 1901.

Three miles, 4:16, G. M. Holley, Buffalo, Aug. 16, 1901.

Four miles, 5:42, G. M. Holley, Buffalo, Aug. 16, 1901.

Five miles, 7:12, G. M. Holley, Buffalo, Aug. 16, 1901.

MOTOR TANDEM AGAINST TIME.

One-fourth mile, 0:19 1-5, Henshaw & Hedstrom, Aug. 10, 1901.

One-half mile, 0:39 1-5, Henshaw & Hedstrom, Aug. 10, 1901.

Three-fourths mile, 1:00 4-5, Crooks-Scherer, New Bedford, Mass., June 9, 1900.

One mile, 1:18 2-5, Henshaw & Hedstrom, Aug. 12, 1901.

Five miles, 7:08 1-5, Duer-Sinclair, Buffalo, July 25, 1900.

MOTOR TANDEM IN COMPETITION.

One-half mile, 0:37, Derosiers-Burroughs, Hartford, Conn., Sept. 7, 1900.

One mile, 1:18 1-5, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Two miles, 2:36 4-5, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Three miles, 3:58 1-5, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Four miles, 5:20 3-5, Crooks-Scherer, Philadelphia, Pa., Sept. 1, 1900.

Five miles, 6:44, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Six miles, 8:04 4-5, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Seven miles, 9:25, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Eight miles, 10:45, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

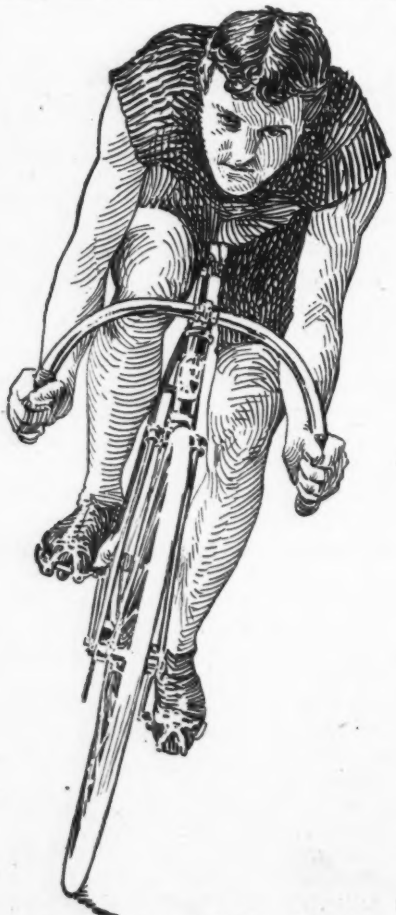
Nine miles, 12:05, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Ten miles, 13:22, Henshaw & Hedstrom, Buffalo, N. Y., Aug. 13, 1901.

Eleven miles, 16:23 2-5, Miller-Judge, Cleveland, May 30, 1900.
Twelve miles, 17:56, Miller-Judge, Cleveland, May 30, 1900.
Thirteen miles, 19:27 2-5, Miller-Judge, Cleveland, May 30, 1900.
Fourteen miles, 20:27, Miller-Judge, Cleveland, May 30, 1900.
Fifteen miles, 22:22 2-5, Miller-Judge, Cleveland, May 30, 1900.
Sixteen miles, 24:59 3-5, Miller-Judge, Baltimore, Md., Sept. 7, 1899.
Seventeen miles, 26:35 2-5, Miller-Judge, Baltimore, Md., Sept. 7, 1899.
Eighteen miles, 27:08 2-5, Miller-Judge, Baltimore, Md., Sept. 7, 1899.
Nineteen miles, 29:40, Miller-Judge, Baltimore, Md., Sept. 7, 1899.
Twenty miles, 31:10 3-5, Miller-Judge, Baltimore, Md., Sept. 7, 1899.
Twenty-one miles, 33:25 1-5, Miller-Judge, Manhattan Beach, N. Y., Sept. 4, 1899.
Twenty-two miles, 34:56 2-5, Miller-Judge, Manhattan Beach, N. Y., Sept. 4, 1899.
Twenty-three miles, 36:36, Miller-Judge, Manhattan Beach, N. Y., Sept. 4, 1899.
Twenty-four miles, 38:11 2-5, Miller-Judge, Baltimore, Md., Sept. 22, 1899.
Twenty-five miles, 39:46 1-5, Miller-Judge, Baltimore, Md., Sept. 22, 1899.

MOTOR TRICYCLE.

One mile, 1:18 3-5, Champion, Chicago, Sept. 25, 1900.
Five miles, 6:49 1-5, Champion, Chicago, Sept. 25, 1900.
Ten miles, 14:21 1-5, Champion, Chicago, Sept. 25, 1900.
Fifty miles, 1:15:57 1-5, Champion, Chicago, Sept. 25, 1900.
One hour, 44 miles, 1,256 yards, Demester, Paris, Oct. 25, 1900; world's record.



Frank Kramer on His Pierce Bicycle.

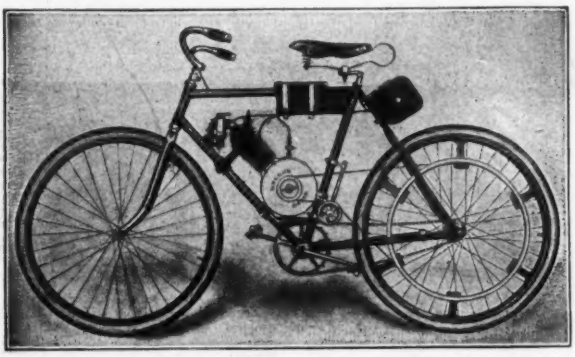
Winner of the Championship

The winner of the national championship, Frank Cramer, rides a Pierce machine, and has done so uninterruptedly for the last three years. The time has gone by when it is possible to make people believe that the machine a man rides is solely responsible for his successes, but certain it is that with an inferior mount many of the hair-breadth wins might have been turned to beatings. It is satisfactory to know that the man who demonstrated his ability to win the championship also possesses the good sense to select one of the best machines ever made in the world to do it on.

The Warwick Cycle & Automobile Co., having issued a catalogue which illustrates both branches of its product, announces, in a letter to this paper that it expects to have as fine a line of cycles as ever for the coming season.

Luthy & Co., of Peoria, replying to an inquiry as to their intentions for the coming season, announce that they do not believe in motor bicycles, but will have an attractive line of the regular pattern for the new year. "We do not take any stock in motor bicycles," they say. "If we were to build a motor vehicle we would put more than two wheels on it."

Mr. Lintott, of Lintott & Buswell, cycle dealers at Nashua, N. H., has purchased his partner's interest and will hereafter go it alone.



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MOTOR-CYCLE

Simplest on the maket.
SINGLE LEVER CONTROL
Speed variation 4 to 25 miles per hour.

PRICE

$200

Agents wanted. Write for Catalogue of Motor Cycle and equipment.

MERKEL MFG. CO.,
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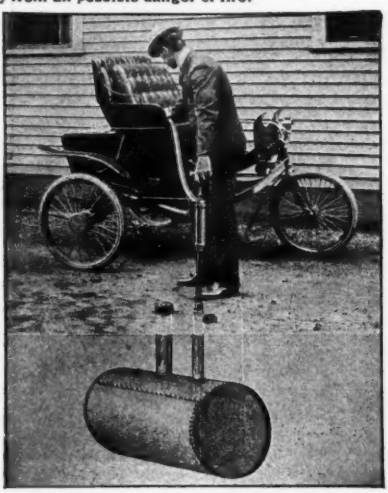
THE SPRINGFIELD GASOLINE STORAGE TANK

The **only safe way** to store gasoline is under ground, away from all possible danger of fire.

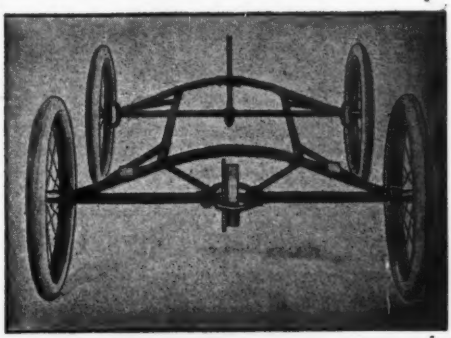


It insures your insurance. Removes all danger to life and property. Will quickly pay for itself in saving what is now lost by leakage and evaporation and may pay for itself a hundred fold by preventing one fire. **Why take further risk?** A strong, durable tank, riveted and soldered, well made, guaranteed tight and furnished complete ready to bury in the ground. Gasoline may be pumped into cans or direct to tank in vehicle. Valuable also to plumbers, dye houses, printers and others using volatile liquids. Write to

GILBERT & BARKER MFG CO.,

Springfield, Mass. **51 Union St., Boston**
82 John St., New York. **12 North 7th St., Phila.**

GEARS



We are prepared to furnish gears complete on short notice; also frame fittings rough or machined, and solicit quantity orders. Material and workmanship of the highest order.

THE CONRAD MOTOR CARRIAGE CO.
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"THE DAYTON" BURNER

(Patent Applied For)

One-piece cast iron Burner. Can't warp or break; will not burn black or blow out. Pilot light burns constantly while carriage is in use. Generator and Pilot Light can be attached to other burners. Send for descriptive circular.

The Dayton Motor Vehicle Co.
1113 East Fifth Street,
DAYTON, OHIO

FROM CORRESPONDENTS

Purvis, Miss., Sept. 20.—To the Editor: Referring to the trouble with my motor, concerning which I wrote you before, I will say that the igniter was put on by the Acme Gasoline Engine Co. It is of the make and break kind and the head is water jacketed. I use Edison's spark coil, made for gasoline engines, which is short and thick. Enclosed find a rough sketch of my igniter, which is actuated by a cram running parallel with the engine. You will see that when the movable electrode drops into the notch on the cam it makes the break and when on the high part the electrodes are separated by a coil spring around the spindle.—Yours, etc., John W. Woodward.

(Unfortunately the writer does not answer the questions asked of him in reply to his former communication, namely, whether the movable contact piece inside the cylinder or either of the contacts are of spring steel, so as to be flexible or, if not, whether there is any outside means of affording an elastic pressure during contact, so as to allow for wear and insure good contact of sparking points. The electrodes are not separated by the coil spring around spindle of movable electrode, as Mr. Woodward states. On the contrary, it is used to bring the electrode together by pulling the lever off the high part of cam. If there is no yielding contact inside or outside, there is no wonder that the motor will not run successfully; but with spring contact inside it would only run a few hours without renewal.—Ed.)

Fight at an End

New York, Sept. 17.—To the Editor: We take pleasure in advising you that all differences heretofore existing between us have been adjusted in an honorable and satisfactory manner. The G. W. Cole Co. has assigned to the Buffalo Specialty Mfg. Co. its application for patent on collapsible tubes for tire fluid, and discontinues the manufacture and sale of Cole's stop leak fluid, and the Buffalo Specialty Mfg. Co. has assigned to the G. W. Cole Co. its patent on Baby and Neverslip grips, and discontinues the manufacture and sale of same. —Yours, etc., G. W. Cole Co.; Buffalo Specialty Mfg. Co.

Locomobile's Formal Objection

New York, Sept. 10.—To the Editor: The best time recorded on the hill in class A was 2 min., 45 sec. by Messrs. Grout Bros. in a runabout carrying a 16-inch boiler. A Locomobile came second and another Locomobile third. No. A 36, a style No. 2 Locomobile, containing a 14-inch boiler and driven by J. Murray Page, was 2 sec. behind the best time. The Locomobile should have been entitled to the first place, as the vehicle was delayed on the hill and caused to stop, the road being blocked by a gasoline carriage. From 20 to 40 sec. was lost by this delay. A formal protest has been handed to the committee, which has not yet ben acted on.—Yours, etc., The Locomobile Co. of America, J. A. Kingman.

Position of a Motor

Dayton, O., Sept. 20.—To the Editor: I am building an automobile and find it more convenient to place the engine crosswise in the vehicle. The question has been raised whether the vibration would be more noticeable than if the motor were placed lengthwise. Can you tell me? I ask the question because I saw a motor placed in this manner in the articles on construction, carried in MOTOR AGE some time ago.—Yours etc., J. Q. Chase.

(There is less vibration when the motor is placed crosswise and the only objection to this form of construction is that it is

limited to a motor of the dimensions given in the "Construction of a Motor Vehicle," published in this paper some months ago. If a larger one were used an unusually wide body would have to be made, which is not to be recommended.—Ed.)

Wintons in the Test

Cleveland, O., Sept. 13.—To the Editor: You will note that our Mr. Winton, on account of the decision to hold the sweepstake race, did not enter the endurance contest. Mr. Bostwick also remained out of the endurance run on account of the Erie-Buffalo. Both Mr. Winton and Mr. Bostwick were to have entered the endurance with 40 horsepower machines. The Winton machines that were in the contest were operated by customers, and are all of the ordinary type, commercial machines.—Yours, etc., Chas. B. Shanks.

Motor Bicycle Question

Brooklyn, N. Y., Sept. 17.—To the Editor: Referring to part six, Construction of a Bicycle Motor, Fig. 29, mixing valve, sectional elevation, what are the two No. 8-32 tap holes for, on the 1 1-16 surface? Nothing mentioned in the article about these. Who handles these castings—any firm in the east, where I can obtain them? —Yours, etc., Chas. Lefrin.

(The holes are drilled into a facing and are designed to attach the valve to some part of the frame. Obviously, the part must be supported on some part of the frame. We do not know of anyone making the castings. Try Lowell Model Co., Lowell, Mass.—Ed.)

Hot Drawn Tube Wanted

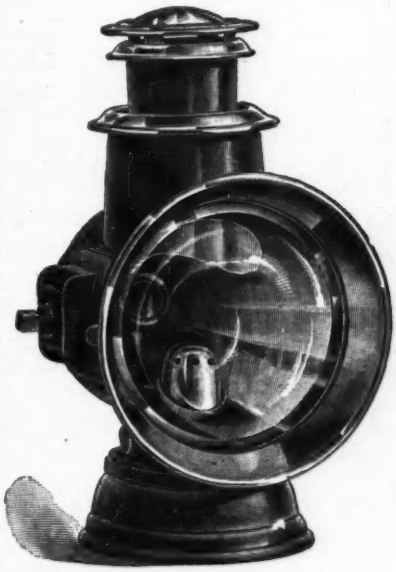
Wollaston, Mass., Sept. 10.—To the Editor: Can you instruct me as to where I can purchase a piece of hot drawn steel tubing, same as described in your article on the Construction of a Gasoline Motor. The tubing is for the muffler.—Yours, etc., Herbert Wardwell.

(The brazed tube made by Wilmot & Hobbs, Bridgeport, Conn., will answer the purpose; or write the Shelby Tube Co., New York.—Ed.)

Chas. Lefrin, Brooklyn, N. Y.—We have an article in preparation which will furnish the information asked for in your letter. It will appear within a week or two.

A Shining Light in Automobile Society

THE Dietz Lamp



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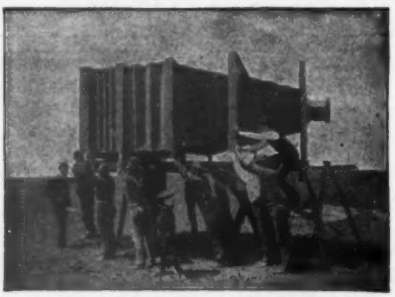

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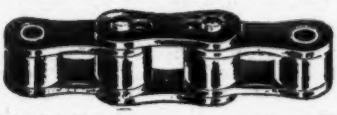

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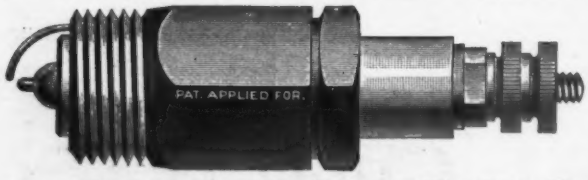

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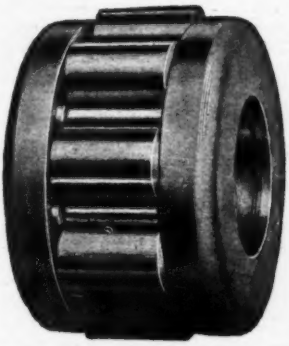

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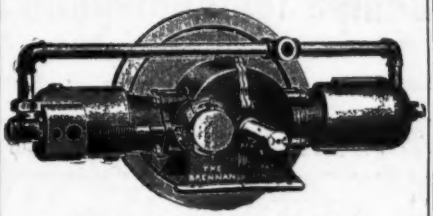

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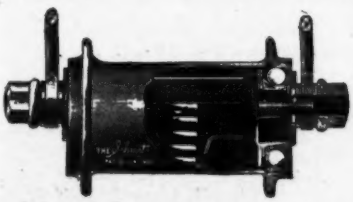

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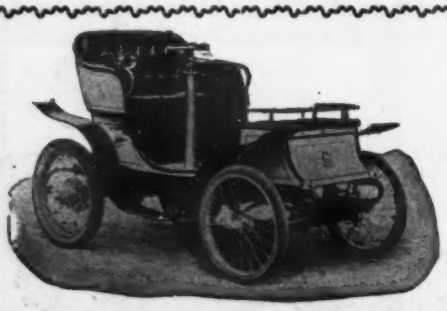

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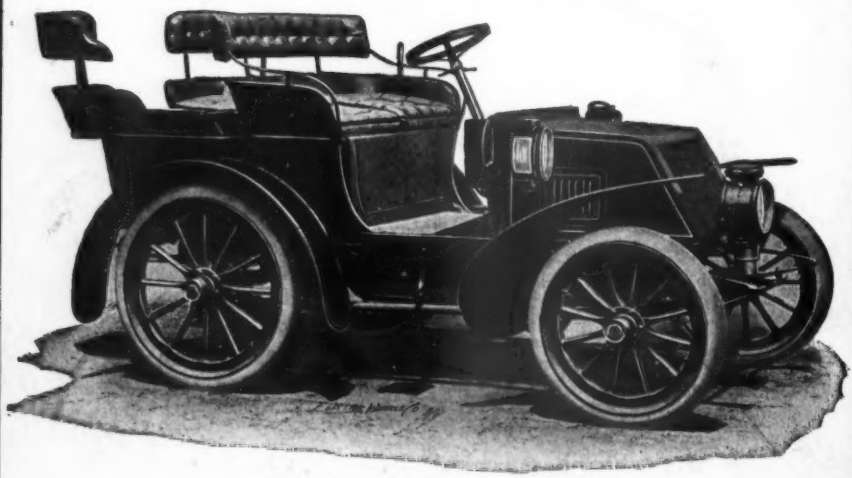

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